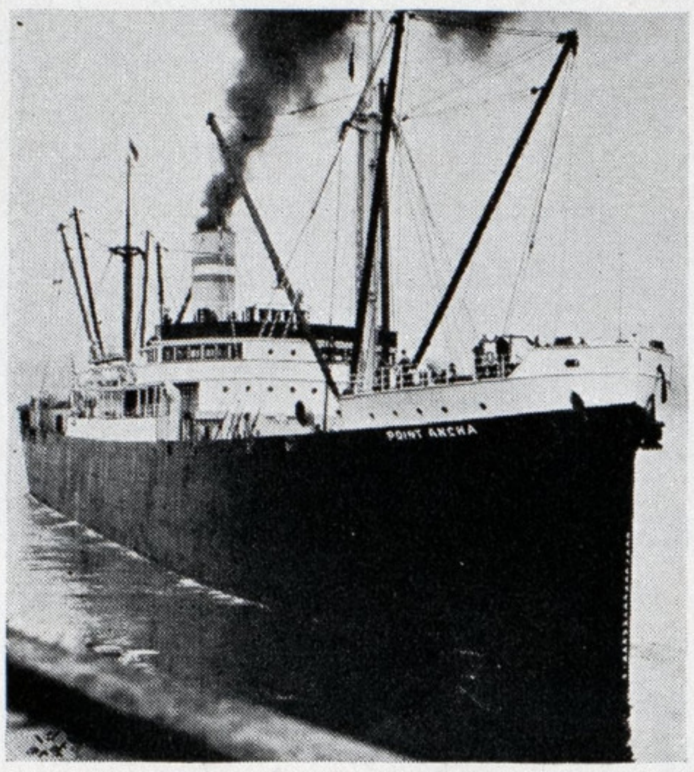
Marine Review

SHIP OPERATION SHIPBUILDING CARGO HANDLING

The National Publication Covering the Business of Transportation by Water

CLEVELAND **FOUNDED 1878** **NEW YORK**



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NRA MEMBER U.S. WE DO OUR PART

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Marine Review

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SHIP OPERATION - SHIPBUILDING - CARGO HANDLING

Volume 64 **June, 1934** **Number 6**

Shipping Code Opposition Is Not Well Founded

TEN months have now gone by since the beginning of the preparation of a general shipping code covering the operations of all elements of water-borne commerce of the United States under all flags. Several proposed drafts, worked out as the result of long and unremitting labor on the part of men of character and intelligence, thoroughly experienced in all branches of practical operation have been presented and discussed in many conferences and at several public hearings. And yet the present outlook for approval of a code for this industry is decidedly unfavorable.

It was confidently expected that approval of a master code would quickly follow the last public hearing held in Washington, April 26-28, but opposition on the part of those groups who prefer freedom to cut rates without let or hindrance, has again balked the preponderant majority of the industry who desire fair competition. Why should not the principles of fair play be applied to the shipping industry?

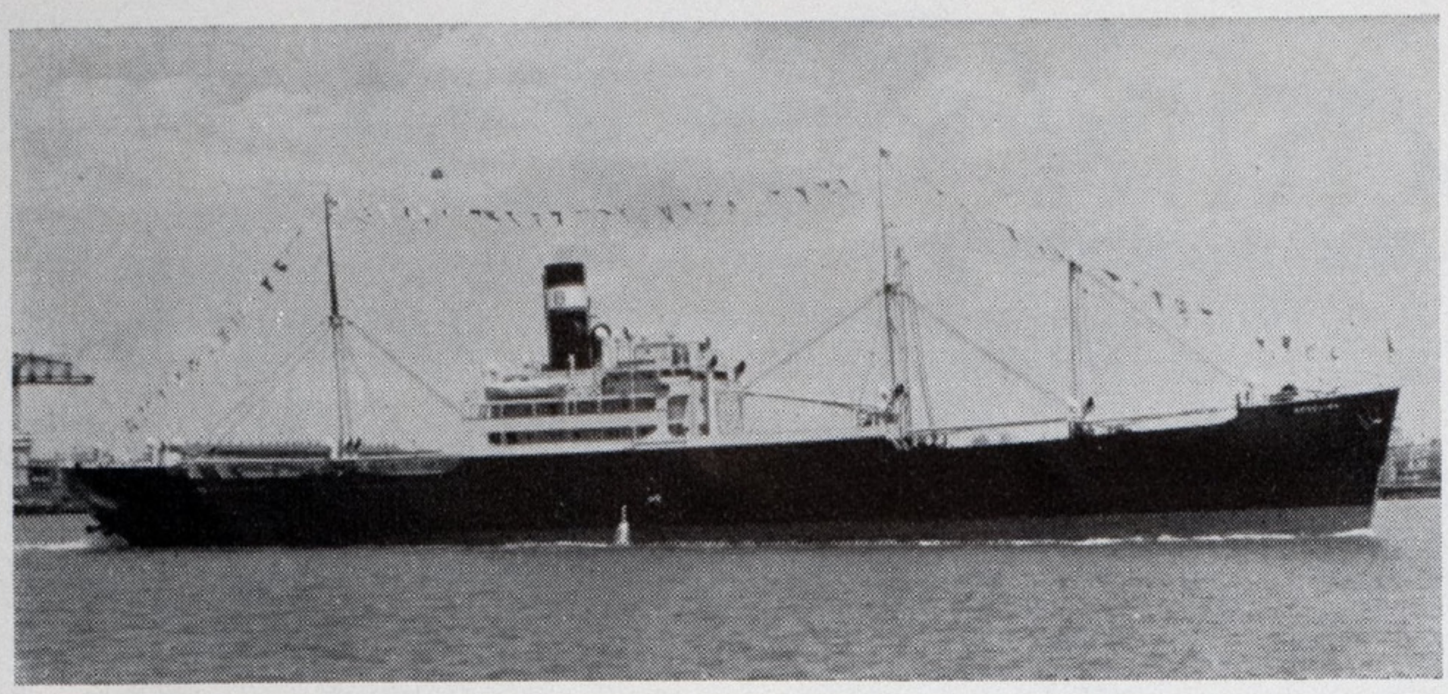
It is inconceivable that the apparent momentary selfish advantage of a few should be allowed to block a measure so urgently needed for order and fair dealing and so vital to the welfare of the industry as a whole. In his address before the Cleveland Propeller club on May 22, Ira A. Campbell suggested that it is far better for the industry to provide for self regulation under a code, with adequate governmental supervision and control than that the industry should be plunged into absolute government regulation. If the industry is unable to regulate itself, governmental regulation is the last refuge; and the next step, if one becomes necessary, will be in the direction of government ownership of transportation facilities. "Of one thing I do feel certain," said Mr. Campbell, "there must be regulation if there is to be prosperity. Without prosperity there will be no private building of ships."

The principal objection to the proposed general code centers on article 8 covering stabilization and regulation of rates, fares and charges. We do not believe these objections are justified on any basis of injury to any individual or company preferring order instead of chaos. Section 1 of that article clearly states that each division and subdivision of the code may prescribe rules and regulations and *minimum* rates, fares and charges applicable to members. This is clearly a case of self-government.

Section 2 of article 8 makes it perfectly plain that no arbitrary action can be taken in fixing minimum rates. Provision is made for a temporary reduction of minimum rates in an emergency and that this can be done without previous notice to the administrator, it being necessary only that such reduction shall be immediately reported to him. As to any other change in minimum rates prescribed under any division or sub-division code, it is provided that 30 days notice shall be given to the administrator, who, if substantial protest against the proposed change is made, may order a public hearing on such change. If no such protest is made the proposed change becomes effective at the end of the 30 days notice unless expressly disapproved by the administrator.

The shipper is also fully protected by the provisions of section 3 of article 7 and by article 8. Under these provisions any shipper or any other responsible person or group charging that any rate, fare or charge, rule, regulation or practice is unfair or unreasonable, will be heard and if the complaint is sustained the action objected to will be suspended.

It is to be hoped that a satisfactory agreement on a shipping code will soon be reached so that this industry, like others, may be protected from practices inimical alike to shipper and shipowner.



S. S. ANGELINA first of two freighters recently completed by the Newport News Shipbuilding & Dry Dock Co. for the A. H. Bull Steamship Co. Sailed on her maiden voyage from New York to Puerto Rico, April 28

S. S. ANGELINA,

New American Freighter Enters Service

BY GEO. R. MASSENBURG

THE two general cargo ships ANGELINA and MANUELA, which have just been completed at the plant of the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., for the A. H. Bull Steamship Co., New York, are the first general cargo ships to be built in this country since 1921.

These vessels, although classified as freight ships, have accommodations for 12 passengers in six staterooms, and the extent of midship house, together with the straight raked stem and cruiser stern, give them something of the appearance of passenger vessels.

The ships are finely formed for speed and have a suggestion of a bulbous bow, but this is a natural consequence of the raking of the stem, and there is no actual bulbing of the bow lines. To further reduce resistnce the rudder is of the stream line type; with fair-water fitted on the forward side of the stern post, meeting and extending the fair-water from the hub of the propeller. Also the shell plating is lapped forward and the exposed edges are slightly rounded. The form is such as to give remarkably good shape and capacity of holds for a hull of such fineness.

Classed in American Bureau

Gibbs & Cox Inc., naval architects, 1 Broadway, New York, were employed by the owners as consulting naval architects, and designed the vessels in collaboration with the designing staff of the Newport News Shipbuilding & Dry Dock Co. A representative of Gibbs & Cox, who also acted as owners' representatives and resident inspector at the works of the Newport News Shipbuilding & Dry Dock Co., approved the working plans and supervised the construction of the vessels. The vessels were also built to the highest class and under the survey of the American Bureau of Shipping, and built and equipped in all respects to pass the applicable rules of the steamboat inspection service, and United States public health service.

The mchinery is amidships, with the rather unusual arrangement of the turbines forward of the boilers, and the boilers fitted on top of deep tank at a height a few feet above the intermediate platform in the engine room, where the working platform is situated. The house for the accommodations is also amidships surrounding the engine and boiler casings.

Principal dimensions and characteristics of the vessels are given in the table on page 11.

The passenger accommodations consist of six large staterooms on the port side of the deck above the bridge deck, with a dining saloon at the after end of the same deck, and a smoking room on the after end of the navigating bridge deck above. The passengers' principal open deck space covered by an awning is a broad expanse of deck for the full width of the ship, over the top of the wheel house and deck officers' rooms. Each passenger stateroom is quite as large as usually found on the largest passenger liners, and has twin beds, a bureau dresser, a lavatory, large wardrobe, and chairs. The two forward rooms have private toilet and shower. The other four rooms have connecting toilet and shower. Each room has two 16-inch airports. The floor covering is finished magnesite, covered with rugs. The bulkheads are plywood, painted finish, in light cream color. The pas-

Smoking room of the S. S. Angelina. Paneled in oak. Fitted with four large casement windows

sageways are painted to match. The doors are of oak, and the airport trim is also of oak.

The dining room is finished in oak plywood panels with painted ceiling and rubber tiled floor. There are four 4-person dining tables, oak sideboard and serving tables.

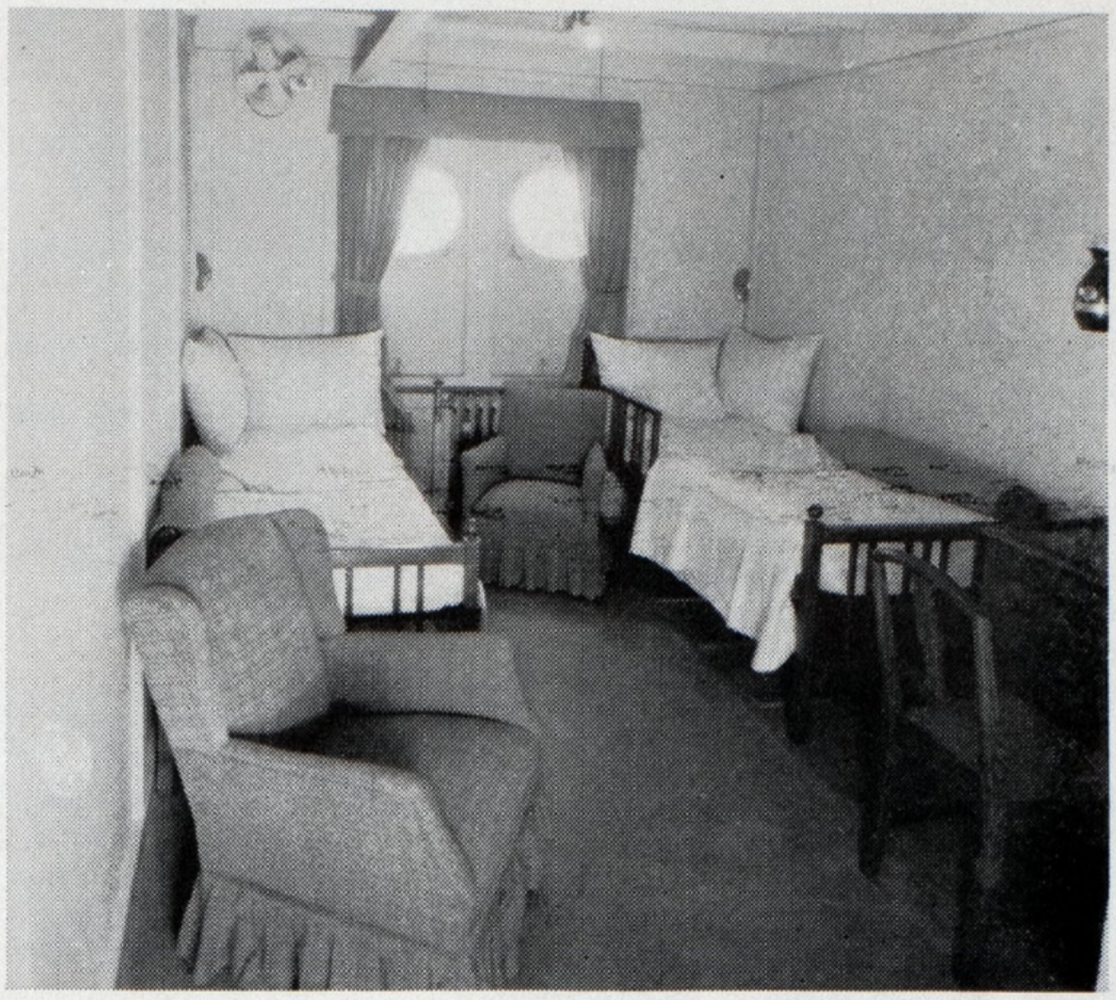
Promenade Deck Space

The smoking room is finished in wide board V-joint tongue and groove oak with a painted ceiling and drop ceiling. The floor is covered with rubber tile, the furniture is of oak and consists of writing desk, two card tables, smoking stand, upholstered settee, card chairs and upholstered chairs. There are four large metal casement windows. There is also an awning covered promenade deck space on each side of the smoking room in way of the life boats. The life boats consist of two 26-foot metal boats carried on Welin quadrant mechanically operated davits.

There are 10 officers and a crew of 28. The principal deck officers' quarters are on the forward end of the navigating bridge deck just aft of the wheel room. The captain has a large stateroom and office on the starboard side finished and furnished in oak, with a private toilet and shower attached. The engineers' quarters are on the starboard side of the deck below, opposite the passenger staterooms. The chief engineer has a large stateroom and office with private toilet and shower attached. The other officers' quarters have plywood bulkheads in oak finish, and furniture to match.

The crew's quarters are on the bridge deck below, and are surrounded with light steel bulkheads and furnished with pipe berths, large metal clothes lockers and benches. At the forward end of this deck there is a purser's stateroom and office with private shower and toilet attached, fitted in oak similar to the other officers' quarters.

The galley is situated at the after end of this deck, with the pantry above adjacent to the dining saloon. Between the pantry and dining saloon there is a specially ventilated lobby with access both to the dining room and pantry through double swing doors so as to prevent as far as possible odors from the galley and pantry entering the dining saloon.



One of the staterooms on the S. S. Angelina. Comfortable and attractive accommodations are provided for 12 passengers in six staterooms

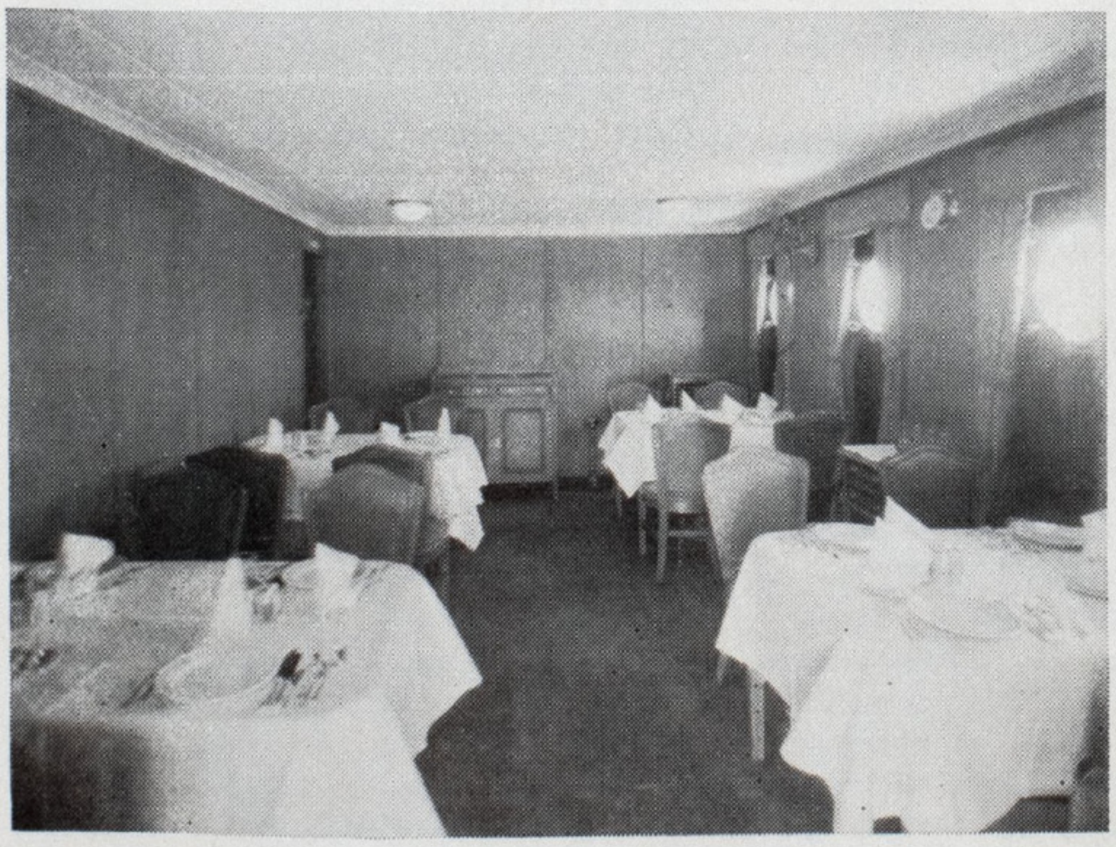
Principal Characteristics

Name	S.S. Angelina and S.S. Manuela
Builder	Newport News S. B. & D. D. Co.
Owner	A. H. Bull Steamship Co.
Launched	S.S. Angelina, Feb. 16, 1934
Launched	S.S. Manuela, March 16, 1934
Delivered	S.S. Angelina, April 25, 1934
Delivered	S.S. Manuela (abt.) May 30, 1934
Length overall, feet, inches	410 9
Length between p.p., feet, inches	390 0
Beam molded, feet, inches	55 0
Depth to upper deck molded, ft., in.	30 6
Load draft, extreme, feet, inches	24 6¾
Deadweight, on load draft, tons	7,250
Gross tonnage	4,773
Net tonnage	2,946
Speed, normal, in service, knots	13
Shaft horsepower, in service	3,150
Cargo capacity, (bale) cubic feet	396,000
Bunker fuel capacity, (full), tons	1,015
Propelling machinery, single screw, Newport News type, cross compound double reduction geared turbines, transmitting 3150 s.h.p. to the propeller at 90 r.p.m.	
Propeller, solid, manganese bronze, right hand, four blades, 17′ 0″ dia. and 16′ 6″ pitch.	
Boilers, two, Babcock & Wilcox watertube, oil burning, operating pressure 300 lbs. per sq. in., and 120 deg. Fahr. Superheat.	
Passenger capacity, in one class	12
Complement, total number	38
Officers	10
Crew	28
Passengers, officers and crew, total	50
Classification	American Bureau of Shipping

Large Freight Capacity

Freight is carried in five main holds and 'tween decks, the upper deck 'tween decks for the extent of the bridge deck, and the poop. The total bale capacity is about 396,000 cubic feet. The ship is subdivided by seven main transverse watertight bulkheads and meets the requirements of the safety of life at sea convention for a passenger vessel. One of the unique features of the vessel is that the holds are almost uniform in length and rectangular in shape with all hatches located nearly at the centers of the holds, so that there is no long haul to any hatch. The main cargo hatches for Nos. 2, 3 and 4 holds are 22 x 35 feet, and those for Nos. 1 and 5 holds are 22 x 25 feet. The main deck 'tween deck is also served by four sliding cargo ports, each 8 feet 6 inches long by 8 feet high. A unique feature of these ports is that the bottoms are flush with the top of the main deck plating, this being accomplished by recessing the main deck in way of the ports. The upper deck 'tween deck space in way of the bridge deck is served by the No. 3 hatch and also by two 4 feet 6 inches x 6 feet cargo doors at the forward end of the bridge house.

The cargo handling arrangements consist of a king post of all welded construction, aft of the No. 1 hatch, with three 50-foot 5-ton booms and three winches serving that hatch. The foremast, of all welded construction, is located between hatchs Nos. 2 and 3, with two 50-foot 10-ton booms and



Dining room of the S. S. Angelina. Finished in oak plywood panels with painted ceiling and rubber tiled floor

Single Screw Turbine Geared Freighter Angelina—Auxiliaries and Equipment

Boilers and Engine Auxiliaries

Two Babcock & Wilcox Watertube Boilers—Fitted with superheaters and soot blowers.
Fuel Oil Burning Equipment—Todd Combustion Equipment Co.
Forced Draft Blowers—B. F. Sturtevant Co.
Generators—Three, 15 k.w. steam reciprocating engine drive—Troy Engine & Mach. Co.
Air Ejectors—C. H. Wheeler Co.
Evaporators and Distillers—Davis Eng. Co.
Feed Water Heaters—Griscom-Russell Co.
Feed Water Filters—Davis Eng. Co.
Lubricating Oil Coolers—Griscom-Russell Co.
Thrust Bearings—Kingsbury Machine Works.
Turbine Thrust Bearings—Kingsbury.
Purifier, Lubricating Oil—Sharples.
Counters and Telltales—Cummings Mach. Wks.
Revolution Indicators—Alexander McNab.
Air Compressor—One, steam driven, 11-inch, 66-cu. ft., with governor, storage reservoir, etc., Westinghouse Traction Brake Co.
Lubricating Oil Heaters—Davis Eng. Co.
Injector—Consolidated Ashcroft Hancock Co.
Telegraphs, Engine Order—Chas. J. Henschel.
Reducing Valves, Strainers—Leslie Co.
Stop Valves—Crane Co.
Relief Valves—Lunkenheimer Co.
Swing Check Valves—Crane Co.
Pressure and Vacuum Gages—Consolidated Ashcroft Hancock Co.
Engine Room Clocks—T. S. & J. D. Negus.
Switchboard Appliances—General Electric Co.
Switches—Trumbull Electric Co.
Motors, Shaft Turning Gear—Electro Dynamic Co.
Flanged Gate Valves—Jenkins Bros.; Walworth Mfg. Co.

Pumps and Services

Main Condensate Pumps—Warren Steam Pump Co.
Reciprocating Steam Pumps—Warren Steam Pump Co.
Main Circulating Pumps—Morris Machine Works; Troy Engine & Machine Co.
Hand Fire Pumps, Hand Pumps—Rumsey Pump Co.

Safety Equipment

Lifeboats, Davits—Welin Davit & Boat Corp.
Anchor Chain—Woodhouse Chain Works.
Anchors—General Steel Castings Co.
Annunciators—Holtzer Cabot Elec. Co.
Navigating Equipment—T. S. & J. D. Negus; John E. Hand & Sons Co.
Mechanical Gongs—Chas. Cory Corp.
Jacob's Ladders—American Chain Ladder Co.
Running Light Indicator—Russell & Stoll.
Running and Signal Lights—Chas. J. Henschel & Co.
Steam Whistles—Ashton Valve Co.

Equipment and Materials

Steering Gear, Steam Driven—Hyde Windlass Co.
Windlass, Steam Driven—Hyde Windlass Co.
Capstan, Steam Driven—Hyde Windlass Co.
Cargo Winches, Steam Drive—Lidgerwood Mfg. Co.
Refrigeration—Carrier Brunswick International Inc.
Wire Rope—Wickwire Spencer; John A. Roebling's Sons.
Electric Motors for Workshop—General Electric Co.
Cable for Lighting System—General Cable Co.
Steel Pipe Booms—National Tube Co.
Ship's Bells—E. A. Williams & Son.
Steel Plates—Carnegie Steel Co.
Steel Shapes—Phoenix Iron Co.
Sternpost Castings—Bethlehem Steel Co.
Gear Rim Forgings—Erie Forge Co.
Pinion Forgings—Midvale Co.
Tailshaft Sleeve Casting—Bethlehem Steel Co.
Plywood—Roddis Plywood Co.; U. S. Plywood Co.
Turbine Rotor Forgings—Midvale Co.
Ship's Bell Clocks—Chelsea Clock Co.
Radio Room Clock—Radiomarine Corp.
Stainless Steel, Bars and Strips—Crucible Steel Co.
Stainless Steel Forgings—Crucible Steel Co.
Tube Sheets—Revere Copper & Brass Co.
Copper, Sheets, Pipe—Chase Brass & Copper Co.
Condenser Tubes—Chase Brass & Copper Co.
Steel Tubing—National Tube Co.
Blocks—Boston & Lockport Block Co.; W. H. McMillan's Sons Co.
Corrosion Resisting Steel—Carpenter Steel Co.; Rustless Iron Co.
Bolts and Nuts—Maryland Bolt & Nut Co.
Ambrac Metal—American Brass Co.
Searchlights—Sperry Gyroscope Co.
Hose, Deck, Fire—Quaker City Rubber Co.
Deck Covering, Magnesite—Selby, Battersby & Co.
Lighting Fixtures—Sterling Bronze Co.
Rubber Tiling—U. S. Products Co.
Lubricating Oil—Texas Co.; Vacuum Oil Co.
Radiators—Crane Co.

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a 50-foot 30-ton boom serving the No. 2 hatch. The winches are compound geared so as to serve the 30-ton boom. Aft of the foremast are three 50-foot 5-ton booms and three winches serving the No. 3 hatch. The mainmast of all welded construction is located between Nos. 4 and 5 hatches, with two 50-foot 5-ton and one 50-foot 10-ton boom, with three winches serving the No. 4 hatch, and two 50-foot 5-ton booms, with two winches serving the No. 5 hatch. All booms are steel.

There is a steam windlass on the forecastle for handling the anchors, and the windlass is provided with two niggerheads for handling the mooring lines. On the poop there is a steam capstan for handling the mooring lines.

Galley of the S. S. Angelina. Located on the after end of the bridge deck, with pantry above adjacent to the dining saloon

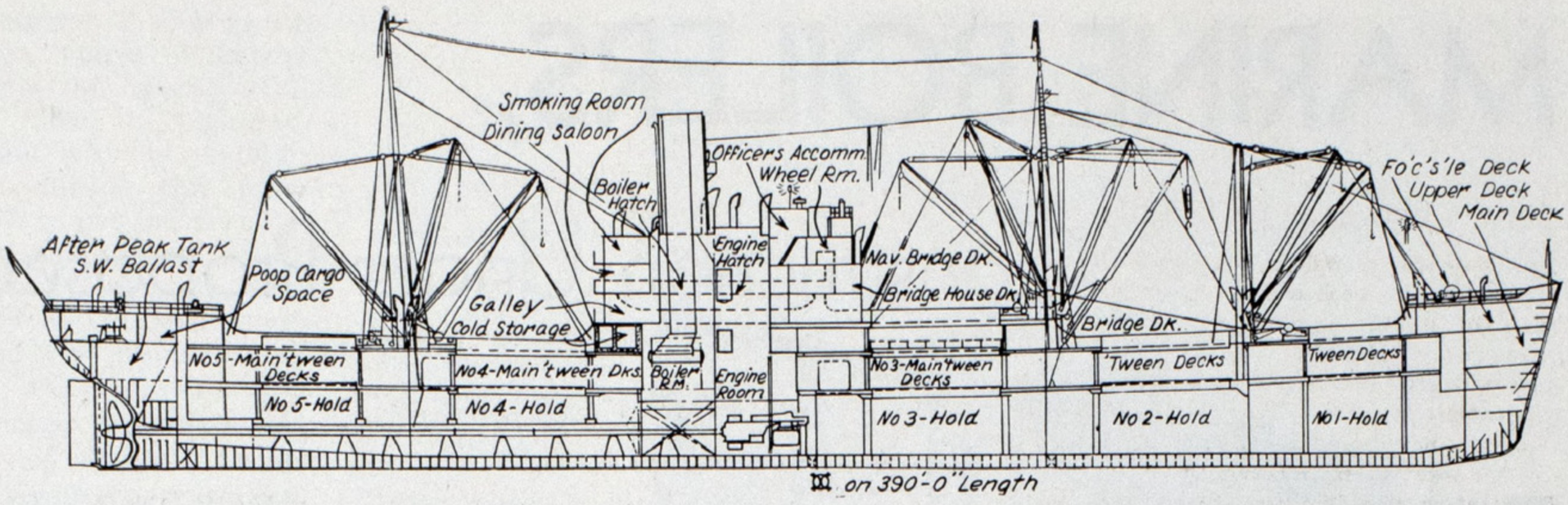
The steering gear is of the right and left hand screw type, driven by horizontal double cylinder steam engine, with hydraulic telemotor control. There are hand steering wheels on the poop deck connected by a clutch to the screw shaft of the steering gear through shafting and gears.

Turbines and Watertube Boilers

The machinery consists of two Babcock & Wilcox watertube boilers for an operating pressure of 300 pounds per square inch and about 120 degrees Fahr. superheat, arranged for burning oil fuel with forced draft. The turbines are of the Newport News type, cross compound, with double reduction gears. The propeller is of the solid type, manganese bronze, right handed, four bladed and 17 feet in diameter.

Sea Trials of the Angelina

On April 19, 1934, the ANGELINA was given a sea trial off the Virginia capes, during which the fuel consumption was measured between the Cape Henry south sea buoy and the Falce Cape sea buoy, distance of 16⅝ nautical miles. One run was made in each direction at an average speed of slightly less than 15¼ knots at about



Inboard profile of the S. S. Angelina and sistership Manuela

90 revolutions per minute. The hourly fuel consumption for all purposes was well under the guarantee, which is based on 13 knots averge sea speed with the ship fully loaded.

There is an evaporating and distilling plant consisting of a 15-ton evaporator and a 250-gallon per day distiller. There is an engineer's workshop equipped with an 18-inch screw cutting engine lathe and about 8 feet between centers, a 20-inch drill press, a 12-inch double emery grinder, and a 24-inch grind-stone, all driven from a countershaft connected to a 5-horsepower electric motor.

The electric generators are located on a platform at the side of the engine room and consist of three steam driven 15-kilowatt, 120-volt machines. The refrigerating plant is of the ammonia direct expansion type and consists of one 1-ton compressor driven by a single acting reciprocating steam engine, one double pipe ammonia condenser, one reciprocating condenser circulating pump and one ammonia receiver. The total capacity of refrigerated space is about 1000 cubic feet.

Quarters Steam Heated

The passengers' and crew's quarters are heated by means of steam radiators of the cast iron wall type, except in the wheel room where a brass pipe radiator is fitted. The radiators in public rooms are covered with ornamental casings. There is an ice water system with a scuttle butt in the crew's quarters, a bubbler in the engine room and self-closing faucet in the pantry and passageway on the bridge house deck. Hot fresh water is supplied to the galley and pantry and all showers and lavatories throughout the vessel. There is a steam smothering system with pipes installed to protect all cargo spaces, the paint room and the lamp room.

The fuel oil is carried in the double bottoms and deep tanks, with a normal capacity of about 500 tons and full capacity of 1015 tons. The boiler feed water is carried in double bottom compartment No. 4 with a capacity of 120 tons. Culinary water is carried in double bottom compartment No. 3 with a capacity of 130 tons and a free standing tank in the bridge 'tween deck with a capacity of 7½ tons.

Leviathan to Sail June 9 In Transatlantic Run

The United States shipping board bureau has decided that the United States liner LEVIATHAN must be returned to service.

Consequently, the big liner is undergoing a thorough overhauling and will sail from New York on her first voyage on June 9, in command of Capt. A. B. Randall, commodore of the United States lines fleet and master of the liner MANHATTAN. Capt. Giles C. Stedman, who has been master of the American merchant liner AMERICAN BANKER, will be transferred to the LEVIATHAN, in his former capacity as staff captain.

The overhauling of the LEVIATHAN to place her in excellent condition for service, it is reported, will cost at least $150,000.

The International Mercantile Marine had pointed out to the shipping board bureau that her sailings had shown an average loss of $80,000 a round trip, and had suggested that, in lieu of the requirements calling for at least seven round voyages per year, the company would set aside a figure equal to the average losses incurred on previous voyages, to be applied in the construction of a third liner similar to the MANHATTAN.

Since the shipping board bureau has decided against this arrangement the line will now operate the LEVIATHAN on at least five round voyages, sailing from New York June 9, June 30, July 21, Aug. 11, and Sept. 1.

Ports of call for the LEVIATHAN will be Plymouth in England and Havre in France, with a call at Southhampton on the return voyage.

In speaking of the resumption of the operation of the LEVIATHAN, P. A. S. Franklin, president of the International Mercantile Marine, said:

"The LEVIATHAN is a fine ship and we will do our best to make a success of running her this year. She is not in bad condition despite the year's lay-up, as she was well maintained right along. When she sails on June 9 she will be in as good a shape as she has ever been.

"Here is an opportunity for the American people to show their appreciation of the American merchant marine by traveling on the LEVIATHAN and using her for mail and express and thus helping to build new ships."

With reference to what effect placing the LEVIATHAN in service might have on the question of building a new ship of the MANHATTAN and WASHINGTON type, Mr. Franklin pointed out that this now becomes a greater problem but that the company is anxious to go ahead with the plan.

Maritime Day Is Observed In Many Sections

The second annual observance of national maritime day, May 22, so designated by act of congress and the subject of a special proclamation by the President, was participated in by more than a score of organizations in many sections of the nation. This is the anniversary of the sailing from Savannah, Ga., on May 22, 1819, of the steamer SAVANNAH, first power vessel to cross the ocean.

General direction of the celebration came under the National Maritime league, a group formed to carry on the work of Georgia Bicentennial commission which took an active part in initiating the new holiday. Other organizations include the Patriotic Women of America, representing 90 affiliated clubs, the Sea Scouts, the New York State Merchant Marine academy, the American Bureau of Shipping, the Mississippi Valley association, the Society of Naval Architects and Marine Engineers, the American Steamship Owners' association, the National Council of American Shipbuilders, the Maritime Exchange, the Propeller club and various other traffic and trade clubs throughout the country.

The celebration this year also paid

(*Continued on Page* 40)

MARINE BOILERS,

Construction Under Proposed Rules

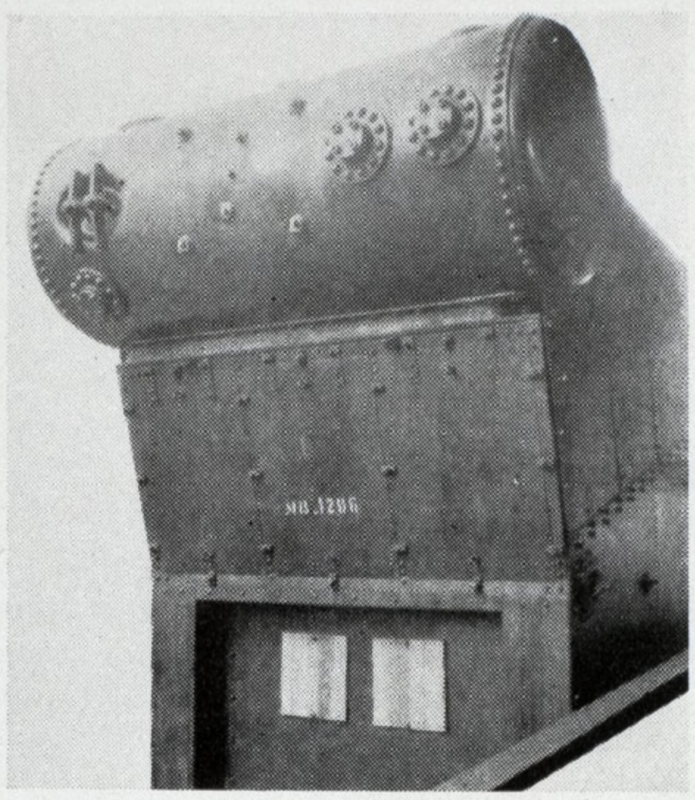
PART I*

THE proposed marine boiler rules of the bureau of navigation and steamboat inspection, when approved, will result in radical changes in the present rules governing the inspection and permissible construction of boilers, coming under the supervision of this bureau. This has led to some conjecture as to whether or not the adoption of the suggested changes will affect seriously the procedure followed in the manufacture of marine boilers or increase, to any considerable extent, their cost.

Parenthetically, it may be said that the proposed rules represent a vast amount of work, and when adopted, as now seems certain, they will stand as a monument to the untiring efforts of the bureau of navigation and steamboat inspection since that body initiated the movement in 1928.

Modern Boiler Construction

In view of the foregoing it may be of interest to review, in a general way, the procedure followed in a modern plant that has been active in the production of boilers for both marine and land service. Although the establishment selected, the Barberton, O., works, of The Babcock & Wilcox Co., may be larger than the average boiler plant, some broad conclusions may be drawn with respect to this conjecture.



A marine boiler. Under proposed rules this drum could be welded

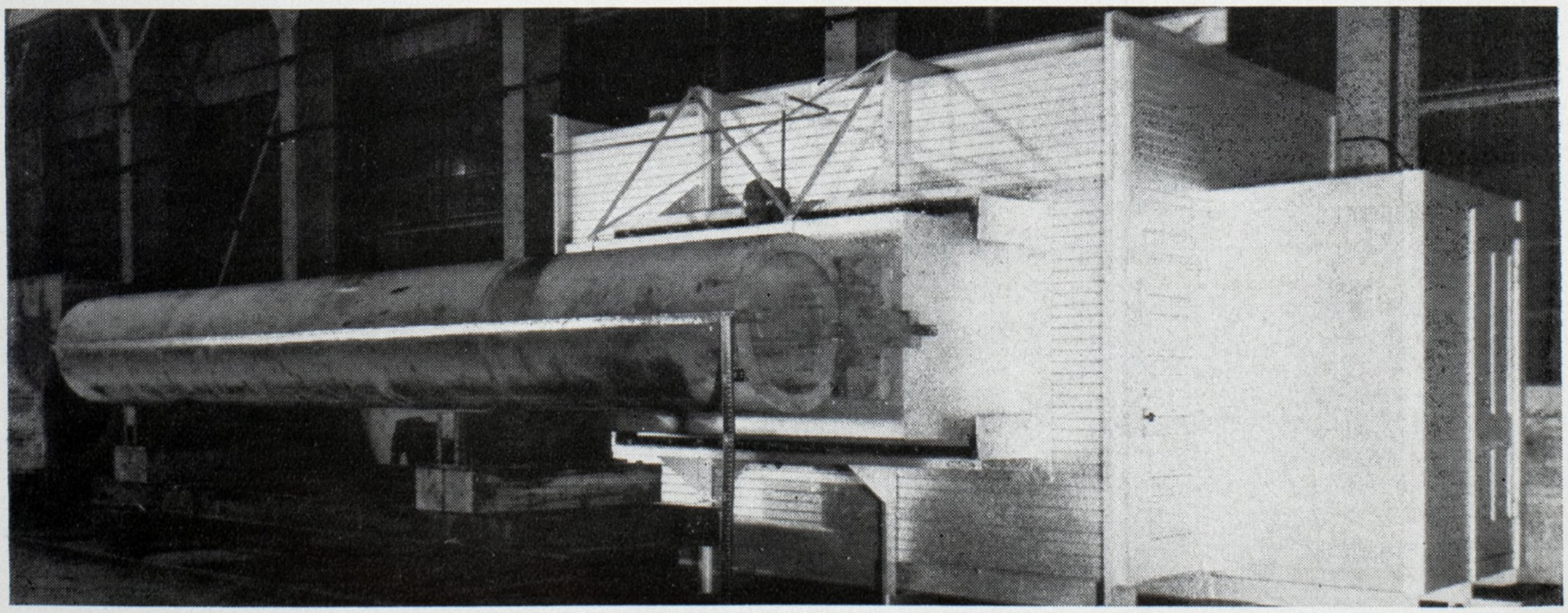
Important facts to consider in this connection are the general aims of the new rules, which are, briefly, to bring them into closer agreement with existing boiler codes and to permit the use of welded drums, a construction now generally accepted for land service. It is thus evident that, although the proposed marine boiler rules were drawn up with proper regard for operating conditions and special requirements peculiar to marine service, recognition is given to certain practices or rules that have proved of value in the construction and inspection of land boilers. It is appropriate, therefore, to examine the shop methods followed in constructing not only marine boilers, but also, in certain respects, land boilers.

Specifications for Materials

Under the proposed rules, boiler plate would have to meet specifications covering chemical composition, tensile strength, and bend tests. It has long been the practice of The Babcock & Wilcox Co. to order plates to specifications that are more complete and, not only to check the properties mentioned, but to investigate other characteristics, including that of micro structure. In addition, for every plate used, a complete history is maintained, in which is recorded the heat from which the plate was rolled at the steel mill, all the tests made at the mill, the tests and examinations made in the laboratories of the company, and the exact location of the plate in the boiler. A similarly complete record is kept of all materials used by a subsidiary company, The Babcock & Wilcox Tube Co. in the manufacture of seamless tubes.

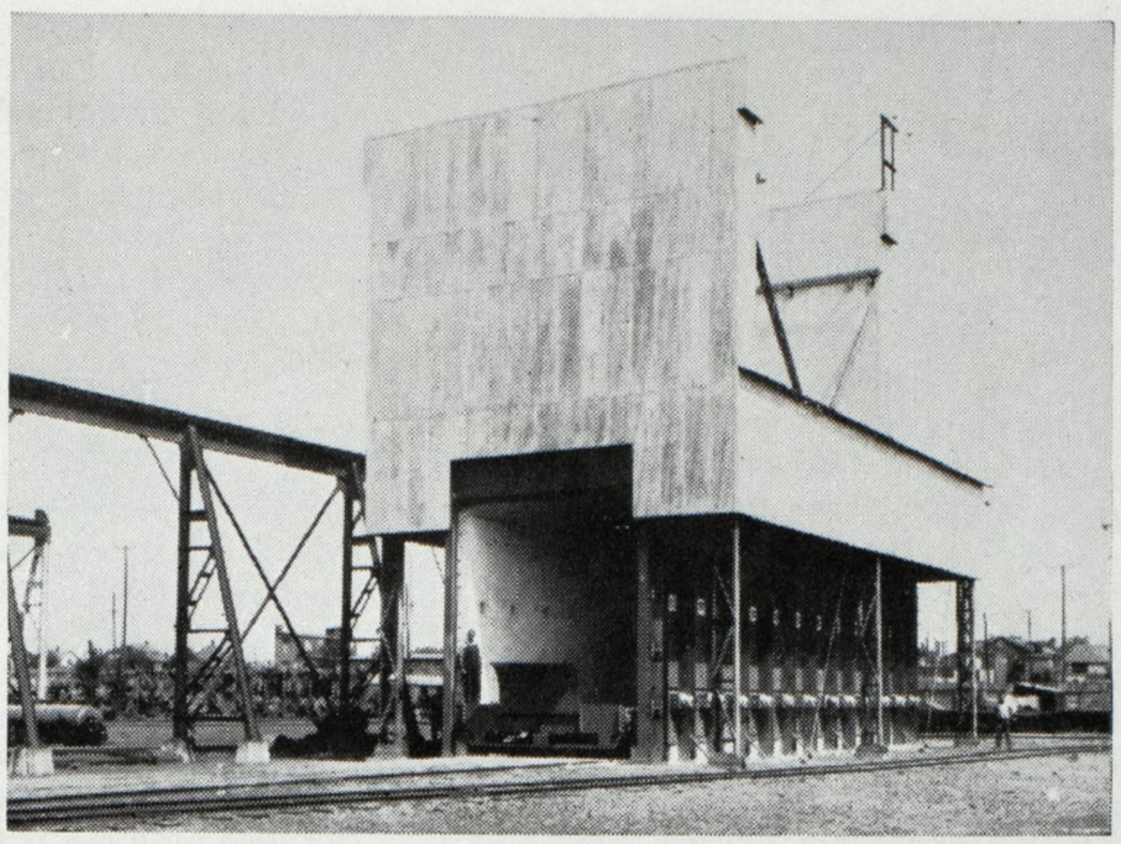
This practice may appear to be somewhat extreme, but, in the opinion of the company, it is simply a method of providing records, which are as complete as possible, for future reference and study of a transaction in which safety transcends all other considerations.

*This article was prepared, at the request of the editor, by the staff of The Babcock & Wilcox Co., and is published in two parts. The second part will appear in the July issue.

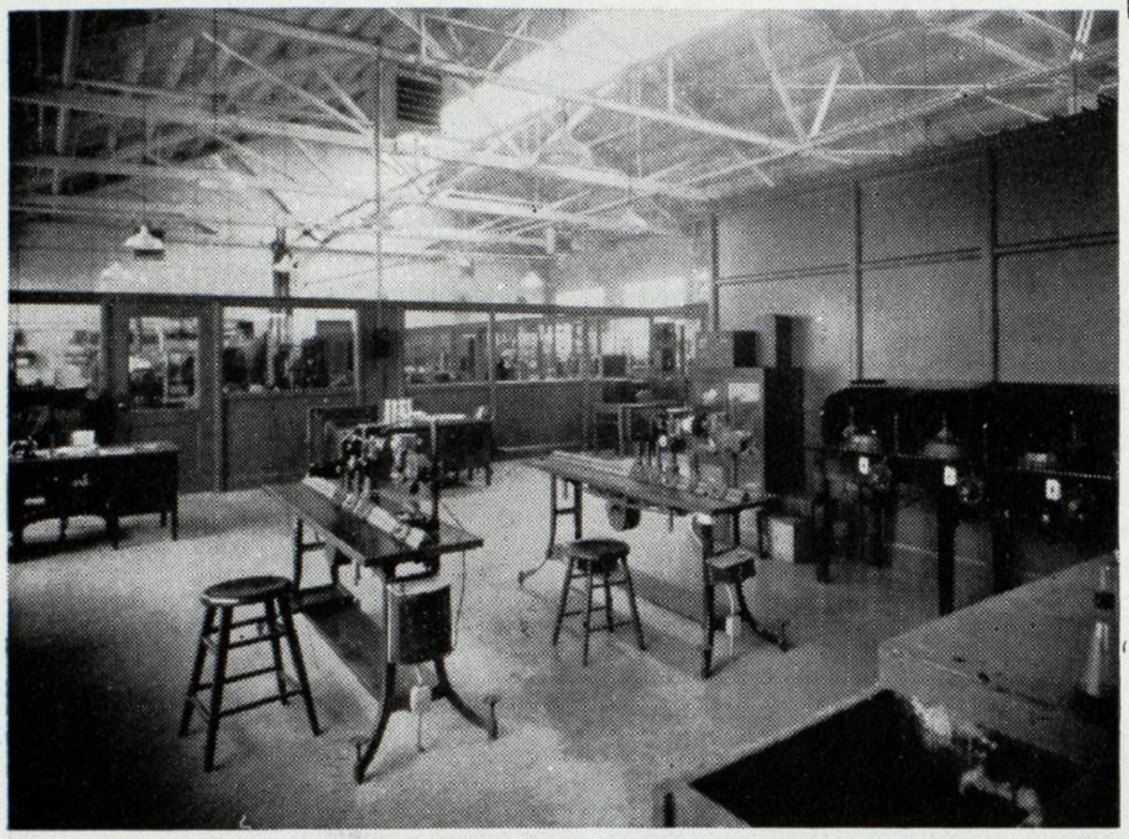


X-ray machine for examining fusion welded pressure vessel seams. Thickness of 4½ inches can be explored on production basis

An important element of what is undoubtedly the most typical of marine watertube boilers is the header. Under the proposed rules, the manufacture of this element will not undergo any change. In viewing this process, one cannot fail to get the very decided impression that special equipment and production technique have been so admirably coordinated as to result in precision-like production of finished forgings. From the charging of the forging furnace with the stock, to the delivery of shaped header blanks at the outlet of the press that forges the headers to shape, every step in the process bespeaks the certainty of results attained in the production



One of the world's largest stress relieving furnaces, Length 60 feet; inside width, 14 feet 6 inches. Used for stress relieving fusion welded pressure vessels



This completely equipped microscopical laboratory is an important element in exact contral and supervision ..of boiler construction and particularly of welded construction

of thousands, even hundreds of thousands, of fundamentally duplicate parts during more than 40 years.

Ends Spun Inward

Although improvements in this process may be difficult to conceive, in one respect an improvement has been effected in recent years. Formerly the open ends of the headers were closed with flat plates, forged in place. Now the ends are heated and rolled or spun inward, on a machine designed especially for the purpose, thus providing ends that are integral with the main body of the header. At the center of the ends, where the spun metal might be porous, small plugs are inserted· these are shouldered inside and welded at their outer ends. Incidentally, this is, on a small scale, the same method the company has used to close in, by spinning, the ends of larger headers and some boiler drums for land service.

The next step in header manufacture is the testing of the blanks, which consists of subjecting these unmachined parts to a hydrostatic test of twice the working pressure.

The blanks are then machined in what may be described as two operations. The one operation consists of trepanning the tube holes in a multiple-spindle drilling machine that, as is the case with much of the equipment used in the plant, was especially designed and built for performing one operation. A typical machine for this purpose is capable of trepanning eight groups of four 1-inch or 2-inch tube holes simultaneously.

In the other operation, elliptical handholes are machined in the side of the header opposite the tube holes. This operation, because of the shape of the holes, is, of course, more complex and consequently is performed on a machine more highly specialized than that used for the tube holes. It will profile eight elliptical handholes in one operation. The header is chucked on a table or carriage under the spindles and is moved in an elliptical path by a cam mechanism while the eight profiling spindles cut the edges of the handholes to the required shape.

OFFICIAL adoption of the proposed new rules covering marine boiler construction, now awaiting action by an executive committee of the board of supervising inspectors, is expected in the near future. What effect adoption of the new rules will have on the methods of marine boiler construction is discussed in this article, the second part of which will appear in the July issue.

Careful Installation of Tubes

The tubes are expanded into the headers in the shop, to form tube sections. In this operation the headers are mounted on racks, or what is termed a "header bench," and securely held in place by a chucking arrangement that automatically sets the headers with respect to the tubes and each header with respect to the other, in a uniform and unvarying position, so that when the sections are later erected in place in the boiler, they will be interchangeable and accurately aligned with the other parts of the boiler to which they must be connected.

Power-driven expanders are used, the operator at one end working two or more tubes in advance of the operator at the opposite end, to prevent any tendency towards the setting up of strains in the tubes—a refinement in operating methods that distinguishes modern boiler-making from the methods that have earned for the old fashioned boilermaker his reputation for crude workmanship.

After the tube sections are completed, each is hydrostatically tested to one and one half times the working pressure, thus concluding one series of tests of materials and workmanship made to assure the accuracy and soundness of the sections. First, there are the tests of materials at the steel mill. These are followed by laboratory tests at the boiler works or tube mill, the spinning-in of header blanks—really constituting another test—the hydrostatic test of finished headers, a whole series of tests of

tubes at the mill, and finally, the hydrostatic test of completed sections. In fact, there are separate series of tests and inspections, such as these, throughout the entire manufacturing process.

The manufacture of drums would, under the proposed rules, undergo a complete change, because fabrication by welding would be permitted and, judging from the wide acceptance of this construction for land service, would soon be the prevailing method. However, this change should in no way work a hardship on a modern boiler shop, since the up-to-date manufacturer is now employing welding for this purpose. For instance in the plant under consideration, more than 1400 boiler drums with fusion-welded seams have been produced to date. Length of seams in these drums and other pressure vessels is over 90,000 feet. Prior to that time, this manufacturer had done considerable research work in fusion welding, and, during the course of this investigation, had made over 10,000 laboratory tests, had carried out repeated-pressure tests of 31 drums and shells, which were subjected to hydrostatic pressures varying from 0 to 1½ times the working pressure, some of them through 2,000,000 cycles.

Many Tests Carried Out

This manufacturer had also tested to destruction, under hydrostatic pressure, four full size drums of different constructions, including riveted and welded, as well as one seamless drum, and had determined the endurance limit of the deposited weld-metal with rotating beam machines, whereby some specimens were given over 30,000,000 cycles of reversed bending stresses.

Before the fusion welding process was finally used for the commercial fabrication of boiler drums and unfired pressure vessels, a complete study was made of nondestructive tests, whereby the soundness of welds in finished products might be determined. This study included an investigation of the practicability and reliability of the various well known physical, chemical and microscopic tests of coupons or test pieces taken from main welded seams, electromagnetic tests, and X-ray examination. As a result, a thoroughly satisfactory test procedure, definitely proving the quality of welds, was developed.

Fusion Welding Dependable

This brief mention of the research and development work carried out by this one company is made merely to emphasize the fact that fusion welding long ago pased the experimental stage and is today a process that can be relied upon. Later in our trip through this boiler plant, we not only shall see how welded seams are made, but also note the precautions taken, in the form of tests and examinations, to provide definite assurancce that drums made by this process for marine boilers will be safe and reliable.

Drum plates are laid out and machined to size. The edges of the plates that, when assembled, will be united by welding are planed to form a conventional U-shaped welding groove. The bending or rolling of the plates to cylindrical form is done in the same manner and by the same process as that used to shape plates for riveted drums—large and thick plates are formed cold in the process or, if they are of unusual thickness, they are hot pressed. Smaller plates are rolled.

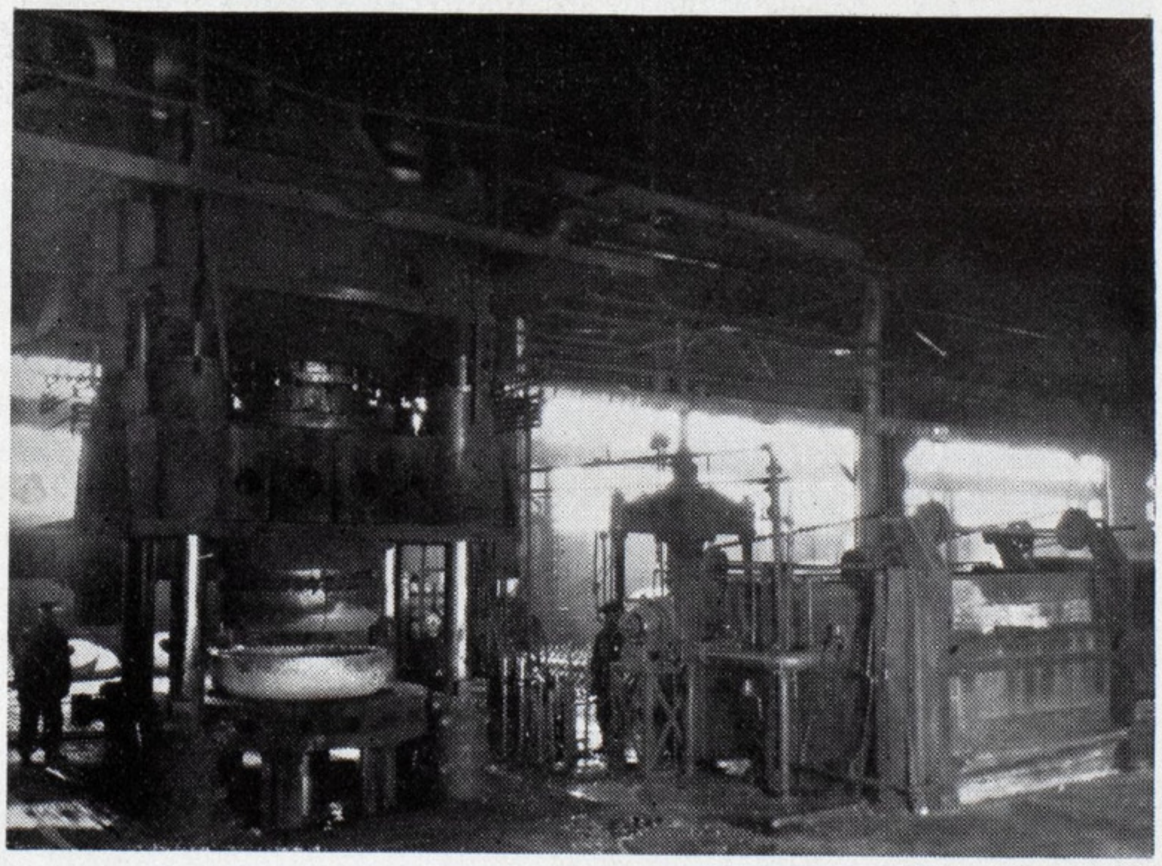
In witnessing the operation of rolling these great plates, one is impressed not so much by the ease with which the massive machines perform the operation as by the accuracy with which the prescribed curvature is attained. That this accuracy is accepted as a matter of everyday skill in modern boiler manufacturing is shown by the fact that the tolerance in circularity allowed by the proposed marine rules is one per cent. No difficulty, however is experienced in fabricating boiler drums to this tolerance.

In viewing the equipment required for this work, the visitor cannot fail to be impressed by its magnitude. On the one hand is a gigantic roll capable of bending plates 26 feet in length; nearby, a mammoth hydraulic press, capable of hot-pressing plates 4¼ inches thick, to form halves of a cylinder of only 30 inches inside diameter, towers above the visitor.

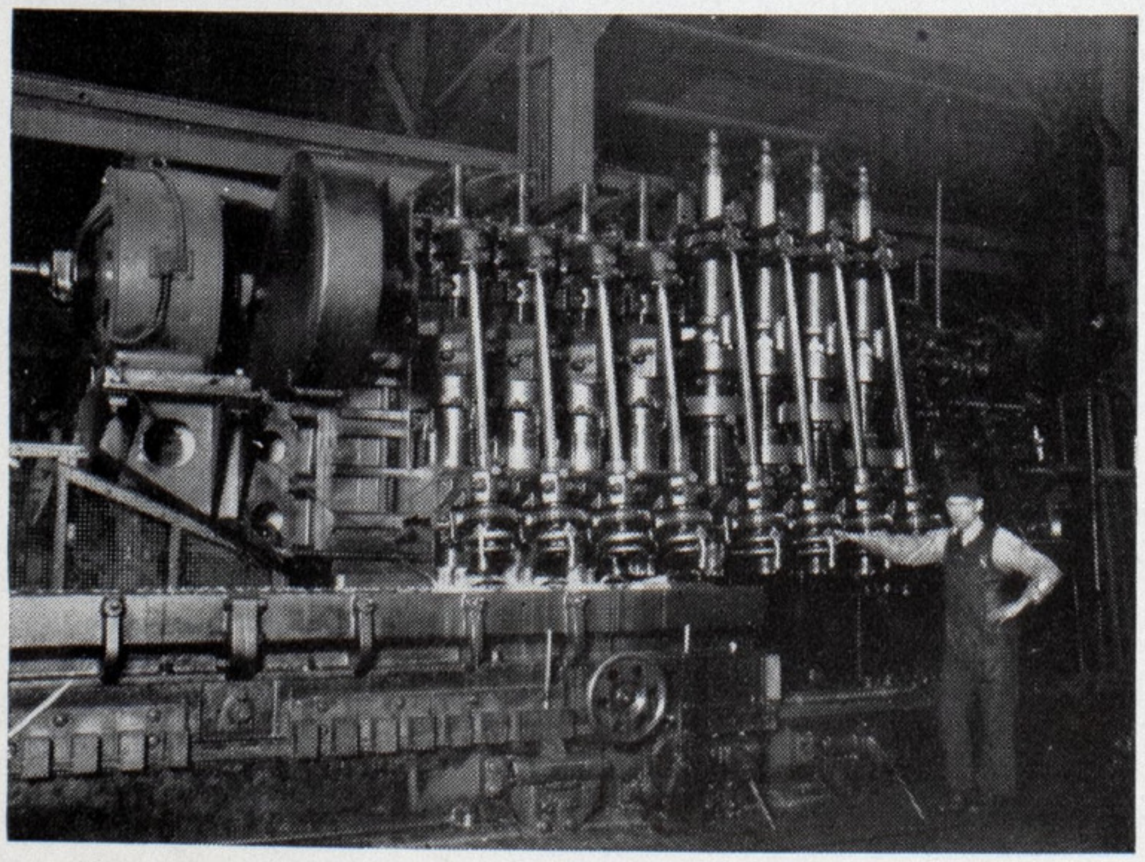
How Welding Is Done

After the plates are formed, they are tack-welded together temporarily with steel strips at the bottoms of the grooves that are to receive the metal deposited during the welding process. The drum is then set up under an automatic welding machine that welds the plate edges together. Flux-coated metal electrodes are mounted in the welding heads of the machines and, as the molten metal from the electrode or rod is deposited in a longitudinal groove, the welding machine moves slowly along the drum, and, in the case of a circumferential groove, the machine remains stationary while the drum is revolved on a special cradle. The electrode, in each case, lays a thin layer of weld metal that is covered by the flux and is thereby protected from the atmosphere. Thus, layer by layer, the weld metal is deposited in the groove, until the joint is completed.

The coating on the electrodes, a re-



A view of part of the forge shop showing a forge furnace at the right and a hydraulic press used for dishing and flanging drum heads



Tube holes of headers for watertube boilers are drilled on a mass production basis—with special machines such as this one

sult of the company's extensive research work in welding, plays an important part in the process, since, as has been stated, it protects the molten weld metal from the atmosphere during deposition. If the metal were not so protected, the oxygen and nitrogen present in the surrounding air would combine with the iron in the molten metal, forming oxides and nitrides that, in turn, would render the weld metal weak, or brittle, or both.

The flux, by forming a blanket over the liquid and semi-liquad metal in the weld groove, prevents this contamination by the atmosphere, and, when the layer of weld metal or bead is laid and cooled, the solidified, brittle slag is easily removed, and the bright weld metal exposed for the laying of the next bead.

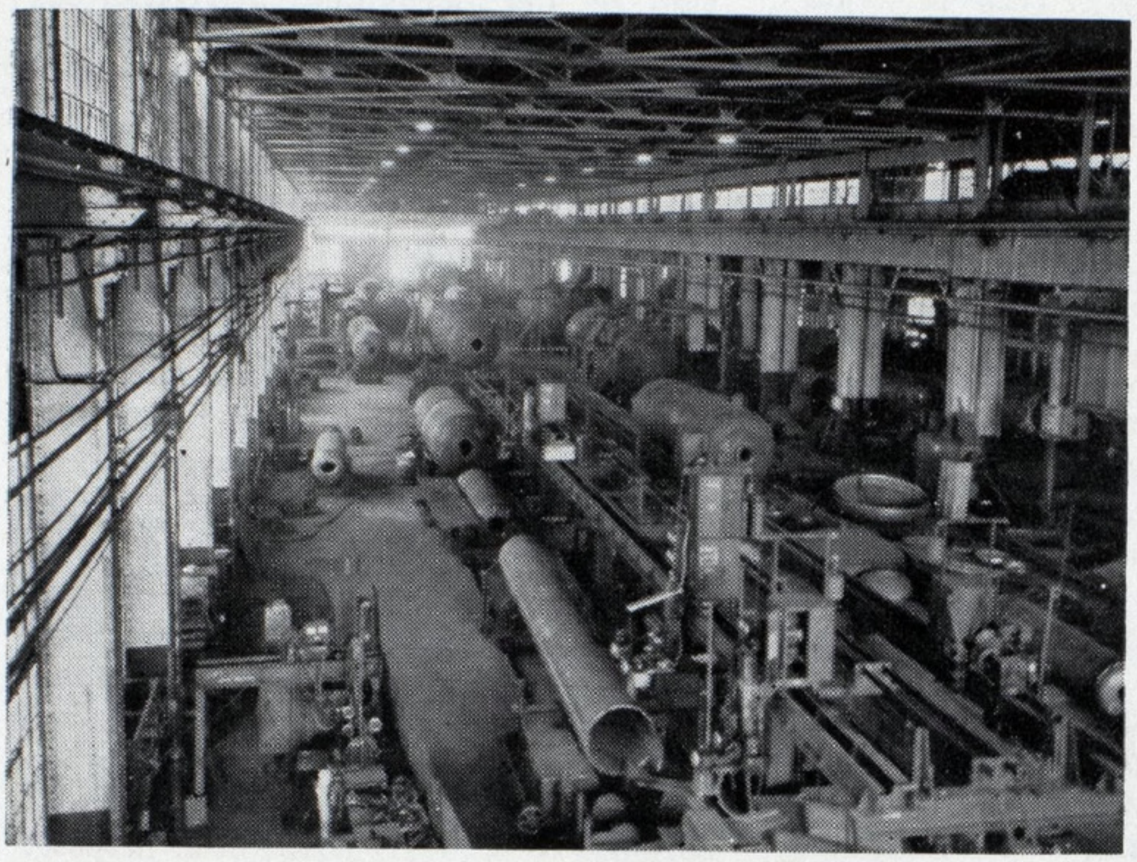
In the development of the welding process, considerable thought was given to the shape of the bead and to its convexity or concavity, since this factor would make easy or difficult the removal of the slag after a bead was laid, and would affect the tendency of the bead to trap or entrain particles of slag during subsequent deposition. It is of interest to note that the shape of bead finally adopted prevents the formation of small grooves or channels in which slag could lodge, and the cleaning operation is so complete as to obviate the possibility of slag inclusions due to improper preparation for the succeeding layer.

Weld Metal in Thin Layers

The deposition of the weld metal in relatively thin layers results in the tendency of each deposit to anneal the preceding layer, and eliminates the danger of damage to the grain structure of the plate metal adjacent to the weld. That this method of metal deposition accomplished the desired result is shown by numerous photomicrographic studies made during the development of the welding process and continued as part of the routine in the regular production of fusion welded boiler drums and unfired pressure vessels.

(To be Continued)

Nine of the 24 Babcock & Wilcox boiler drums with fusion welded seams for scout cruisers of the United States navy. Ordered in 1930. First boilers of this construction for naval vessels



Section of shop devoted to welding at the Barberton, O., plant of The Babcock & Wilcox Co. Welded equipment of widely varied size and type can be produced in this shop

Machinery for Submarines Will Not be Delayed

The Elliott Co., Ridgeway, Pa., working on a sub-contract from the Winton Engine Corp., calling for deliveries during July, August, September and October of sixteen 900-kilowatt generators, sixteen 1075-horespower motors, twelve 100-kilowatt generators, submarine control equipment and reduction gears, for submarines 172, 173, 174 and 175, now under construction by the Electric Boat Co. and the Portsmouth N. H. navy yard, complained early in May to the national recovery administration that these contracts could not be fulfilled under the 36-hour week restrictions of the electrical code.

A letter from officials of the Elliott Co. was supported by one from Henry L. Roosevelt, assistant secretary of the navy, in which he urged the recovery administration to do all in its power to aid the company. The Elliott people stated that though they were using every available skilled workman possible, 36 hours per week were not enough, and added that the contracts had been bid for before the adoption of the code, and no provision had been made in them for the payment of overtime penalties.

Code Permits Extra Hours

A simple solution of this difficulty was disclosed when the authorities of the recovery administration, in examining the electrcal code, found that it clearly stated, where seasonal or peak demand or legitimate emergencies must be met, the industry may work its skilled employes beyond the 36-hour limit, the only requirement being that at the end of each month any such overtime be reported to the code authority in terms of extra man-hours worked and the reason therefore.

This point was immediately called to the attention of the Elliott Co. and machinery for the submarines will be finished on time.

U. S. Fleet Transits Canal

The entire United States fleet in company, comprising a total of 110 vessels, which for some time past have been stationed in Pacific waters, began transit of the Panama canal, from the Pacific to the Atlantic side, between five and six o'clock on the morning of April 23 and successfully completed the transit, at Colon on the Atlantic side, at 5 o'clock on the morning of April 25. The whole operation covered an elapsed time of 47 hours. Admiral D. F. Sellers, commander-in-chief of the fleet, in a message to Secretary Swanson, said in part:

"The continuous transit of the canal by the fleet as a unit has been a very valuable experience for all hands and it is believed that much useful data has been obtained. It is suggested that suitable acknowledgement be made to the war department for the efficient manner in which everything connected with the transit of the fleet has been handled by the canal authorities."

Liner Sinks U. S. Lightship, Seven Lives Lost

A very unusual accident occurred on the morning of May 15 when the White Star liner OLYMPIC bound from Southhampton to New York, during thick weather, rammed and sank the Nantucket shoals lightship with a loss of seven members of the lightship crew. The following message was received by officials of the White Star line at 9:30 p.m., May 15 from Capt. J. W. Binks, master of the OLYMPIC:

"While in thick weather, proceeding at slow speed, collided with the Nantucket light vessel at 10:06 a.m. Light vessel sank.

"Two boats lowered at 10:09 and 10:12. Seven survivors rescued. Four of crew missing. Of survivors three have since died.

"Later, motorboat, fitted with wireless, was lowered to assist and bring back the two boats. Ship anchored at 10:35 a.m. until boats returned then proceeding at 11:29 a.m. All time eastern standard.

"All ships and shore stations notified.

J. W. Binks, Master"

Investigation Ordered at Once

A full investigation of the accident was immediately ordered by Secretary Roper and the preliminary fact finding hearing was held in the Customhouse at New York on May 17. The members of the special committee were: George R. Putnam, commissioner of lighthouse; D. N. Hoover, assistant director, bureau of navigation and steamboat inspection; and Rear Admiral J. G. Tawresey, U. S. N. (retired), representing the shipping board bureau. This preliminary investigation was for the purpose of determining the facts and not to fix responsibility. It is expected that the British board of trade will also conduct a thorough examination.

Warning Had Been Issued

It will be necessary to wait for the report of the investigating committee before the real causes of the disaster can be ascertained.

In view of this disaster it is of special significance to note that the *lighthouse service bulletin* of the department of commerce for May 1, 1934 had as its leading article a discussion of the necessity of care in approaching lightships on radio bearings. A part of this article is quoted as follows:

"Radiobeacons placed on lightships provide very valuable leading marks in approaching the coasts and ports. Consequently nearly half of the radiobeacons on the Atlantic and Pacific coasts of the United States are located on lightships. Several recent incidents, however, show that serious risks are incurred by masters of steamers using radio bearings to set courses directly for the lightships, without suitable precautions. Recently an Atlantic liner in approaching Nantucket lightship in a dense fog, found the radio bearing so accurate that the steamer scraped the side of the lightship and carried away the antenna yards; the other signals of the lightship were not heard in time to permit the course to be changed to pass clear; also the crew of the lightship did not hear the steamer's fog warning whistle in time to give any special counter warning.

"It is exceedingly dangerous navigation to proceed on a radio bearing directly for a lightship, counting on hearing the fog signals in time to change course and pass safely. The vagaries of sound fog signals are well known, and such signals may not be heard with certainly in time to avoid a collision, serious alike to the approaching vessel and to the lightship; the loss of the latter would dangerously affect all other navigation in the vicinity."

Relief Lightship Placed

Secretary Roper conveyed to the families of the crew of the lightship appreciation of the loyal service of the men who had lost their lives and deep sympathy for members of their families.

A relief lightship was placed on the Nantucket station 26 hours after the accident.

The Nantucket shoals lightship occupies a station not only of first importance in guiding transatlantic shipping approaching the coast, but of considerable peril because of its location 41 miles from the land, in the track of hurricanes and in an ocean area traversed by heavy marine traffic, and often, as was the case when the accident happened, blanketed in fog. Despite the dangerous location this is the first serious disaster that has occurred at this station in many years.

Among the survivors of the disaster was Capt. George Braithwaite, commander of the lightship, who asserted that everything on his ship was working perfectly and his radio operator declared his signals were being sent off with clocklike regularity.

Edward D. Tenney Dies

Edward D. Tenney, board chairman of the Matson Navigation Co., died at San Francisco, April 29, at the age of 75.

He was one of the leading business men in the trade between Hawaii and the mainland. He divided his time between San Francisco and Honolulu where he was chairman of the board of Castle & Cook, a shipping and travel firm, and also of the Bank of Hawaii.

Mr. Tenney was born in Plainfield, N. J. He went to Honolulu at the age of 18 where shortly afterwards he entered the employ of Castle & Cook, with which company he was connected for over 50 years.

Peacock Heads Ship Bureau as Acting Director

J. Graig Peacock was appointed acting director of the shipping board bureau by Secretary Roper on May 6, following the definite retirement of H. H. Heimann.

A month previously Mr. Peacock had been appointed special assistant to the director and a member of the advisory shipping committee. At that time it was understood that Mr. Heimann would continue to direct major policies and affairs of the bureau even after his return to his position as executive manager of the National Association of Credit Men, pending the selection of his permanent successor as director. A week's trial of this arrangement made it clear to Mr. Heimann that it was not practicable and he therefore withdrew completely from any connection with the direction of the affairs of the bureau, though this has not been officially announced by the secretary of commerce.

The official announcement from Secretary Roper's office on May 7 in connection with these developments is as follows:

"Mr. Heimann has requested a temporary leave of absence from his position as director of the bureau to assist in the organization of the annual convention of the National Association of Credit Men from which association Mr. Heimann recently took a leave of absence to accept a position of director of the shipping board bureau at the request of the secretary of commerce." The statement also quoted the following communication addressed to Mr. Heimann by the secretary of commerce as follows:

"Agreeable to your recommendations of May 3 that I appoint an acting director of the United States shipping board bureau, I hereby designate J. Craig Peacock to act as director during the days of your absence from the bureau, between now and June 30, 1934."

Daniel Bacon Dies

Daniel Bacon, chairman of the board of the West Indies Steamship Co., New York, agent for Elder, Dempster, & Cook Ltd., died May 10 at Montevideo at the age of 71. With his wife he was on a world cruise on the Cunard liner FRANCONIA at the time of his death.

Mr. Bacon came from an old New York shipping family. He was prominent in yachting circles. He was born in New York city, Aug. 27, 1862. At the age of 17 he went to sea as an apprentice on a clipper ship to learn seamanship and navigation. On his return he entered his father's office. Later he opened his own office as freight broker and became agent and part owner of several sailing vessels.

LAKE CARRIERS

Hold

Annual Meeting

Capt. Joseph S. Wood

POSTPONED from April 19, the annual meeting of the Lake Carriers' association was held at Cleveland, May 3. Though no prophecies were made as to the probable increase in shipping activity on the Great Lakes for this season, it was clearly evident from the general attitude of those present that a decided improvement over last year is anticipated.

Of the 399 vessels of 2,190,807 gross registered tonnage owned by members of the Lake Carriers' association, 83.5 per cent was represented at the meeting directly or by proxy. The meeting was called to order by Capt. Joseph S. Wood, president of the association. The number of directors was increased from 40 to 43. The new directors are: Elton Hoyt II, John M. Gross, George M. Humphrey, A. T. Wood, W. W. Newcomet, H. S. Noble and F. C. Oakes.

The executive committee was increased from 10 to 12 in number. The new members of the executive committee are: John M. Gross, Elton Hoyt II, George M. Humphrey, J. T. Kelly and W. W. Newcomet. The officers were all re-elected and are: President, Capt. Joseph S. Wood; vice president, L. C. Sabin; vice president, secretary and treasurer, George A. Marr; and general counsel, Newton D. Baker.

George M. Steinbrenner, chairman of the welfare committee, presented a brief oral report in which he recommended that the monthly bulletin covering the activities of the committee and other pertinent matters be continued. He also recommended the continuation and the extension of safety work aboard ships through committees of the men on each vessel. Throughout the past winter no less than 84 men received original licenses and raises of grade as a result of attending the engineering and deck department schools maintained for the benefit of the men by the Lake Carriers' association. Of these, 45 were in the engineering department and 39 in the deck department.

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Officers

Lake Carriers' Association

President
JOSEPH S. WOOD
Vice President
L. C. SABIN
Vice President
Secretary and Treasurer
GEORGE A. MARR
General Counsel
NEWTON D. BAKER

Executive Committee

Joseph S. Wood, Chairman, Ex-Officio

A. E. Cornelius, A. F. Harvey, C. L. Hutchinson, J. M. Gross, A. E. R. Schneider, Elton Hoyt II, G. A. Tomlinson, G. M. Humphrey, H. S. Wilkinson, W. J. Conners Jr., J. T. Kelly, W. W. Nowcomet.

Alternates

J. Burton Ayres, Frank Armstrong, R. W. England, J. J. Boland, A. H. Ferbert, Warren C. Jones, F. I. Kennedy, Walton H. McGean, H. S. Noble, F. C. Oakes, A. C. Sullivan, G. M. Warner.

Directors

Joseph S. Wood, Chairman

From Cleveland

Frank Armstrong, J. S. Ashley, J. Burton Ayres, Newton D. Baker, S. B. Cady, C. C. Canfield, R. W. England, A. H. Ferbert, J. M. Gross, A. F. Harvey, Elton Hoyt II, G. M. Humphrey, C. L. Hutchinson, Warren C. Jones, John T. Kelly, Geo. S. Kendrick, F. I. Kennedy, Geo. A. Marr, Walton H. McGean, R. J. Paisley, C. J. Peck, L. C. Sabin, A. E. R. Schneider, Geo. M. Steinbrenner, H. C. Strom, Baird Tewksbury, G. A. Tomlinson, R. B. Wallace, Geo. H. Warner, A. T. Wood.

From Other Cities

J. J. Boland, A. E. Cornelius, W. J. Conners Jr, J. E. McAlpine, H. S. Noble and F. C. Oakes of Buffalo; H. F. Hughes and A. C. Sullivan of Chicago; J. G. Munson of Rogers City; W. W. Newcomet, Sheboygan, Wis.; W. P. Snyder Jr. of Pittsburgh and H. S. Wilkinson of New York.

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Much thought has been given by the committee to the obstruction of channels by the equipment needed for their improvement, and it has been able to arrange that this work be carried on without undue interference with safe navigation. The captains of the vessels should make it a point to keep themselves fully informed on all notices issued by the government affecting navigation on the courses in which the vessels are engaged.

The report expressed the hope that every fleet manager will issue instructions to his captains to notify the proper government offices of any conditions which should have the attention of these offices in connection with such matters as misplaced buoys, lights out or any other matter affecting the safety of navigation. During the year the shore captains' committee made numerous recommendations to the executive committee on many varied matters concerning the safety of navigation and improvements in operation.

Capt. R. W. England, chairman of the shore captains' committee, presented an interesting report on the committee's activities for the year 1933. He said that during the year 11 meetings, more than the usual number, had been held due to the many changes called for in navigation of rivers and channels because of the large amount of work going on in improving these waterways. The committee has given careful attention to the recommended drafts for the opening of navigation, which due to the extremely low water prevailing is understood to be 17 feet, 6 inches. In this respect the committee will make further recommendations from time to time as the season progresses.

Mariners in the Making, Sea Scout Activity

No merchant marine can ever flourish without an intelligent, well-trained, hardy personnel having the basic qualities of character, initiative and courage. Every encouragement should therefore be given to all efforts in preparing the youth of the land for duty at sea. An important part in this work is being taken by the merchant marine training schools and ships sponsored by several of the states such as New York, California, Massachusetts and Pennsylvania. These institutions are maintained to give practical and technical training to boys who have decided on a career at sea, while the sea scout program, within the boy scout movement, gives an opportunity for boys all over the country to develop any natural aptitude or attraction they may have for life at sea. The sea scout program is essentially for older boys after they have had preliminary training as boy scouts. Its activities are concerned with swimming, sailing, rowing, sea history, seamanship, life aboard ship, rules of the road at sea, foreign commerce, navigation, piloting, signaling and cruising.

Sea Scout Training

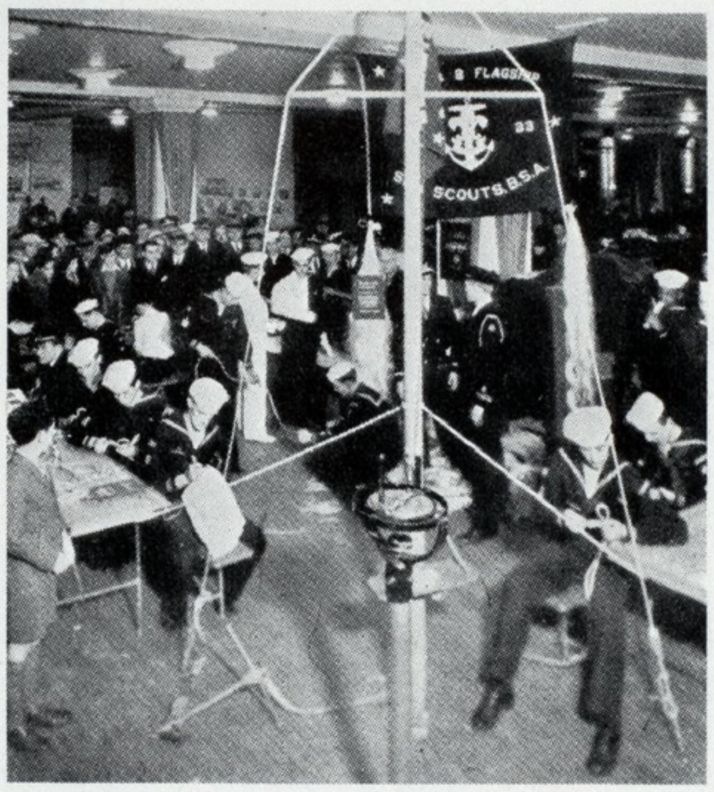
It is an all year round activity. The weekly meetings throughout the late fall, winter and spring prepare the boys so that they are better fitted for life on the water in the summer activities. There are many successful sea scout ships in the country.

An example of the effective work done by this movement was the selection of eight sea scouts as the crew for a sailing yacht bound to the Arctic ocean on a scientific expedition—a difficult, dangerous and exciting adventure. These boys were selected because the leader of the expedition found that they had all the essential qualities necessary for this arduous duty. These qualities, it is fair to say, had been fostered and developed and tested during the years that these boys were engaged in sea scout activities. Furthermore, they had what is rare nowadays, a knowledge of seamanship and the ability to handle a sailing ship. The success of the enterprise and the unstinted praise of the leader of the expedition proves the practical value of the training.

At the last motorboat show, held at New York, the sea scout committee of Manhattan council was responsible for the exhibit of the work of the sea scouts. With the co-operation of companies interested in nautical supplies, and first-aid equipment, such as the Plymouth Cordage Co., Johnson & Johnson, and various other manufacturers, materials were obtained for use by the boys in demonstrating such activities as the making of knots, knot boards, sea bags, etc., as indicated in the accompanying illustration. The S. S. MANHATTAN, one of the two largest, finest and newest of American built merchant ships, is the flag ship for region No. 2 of the sea scouts in that area.

As organized units, trained in nautical and marine affairs, the sea scouts have done excellent service in helping to maintain order and in serving as guides and messengers.

Units are now established in many parts of the country. That it is not a program for the sea coast only is indicated by the fact that the majority of units are located in interior sections of the country, where the activities are carried out on rivers and lakes. The sea scout program is open to all boys who are 15 years of age or over, but it is recommended that none but first class scouts be registered as sea scouts at this time.



Sea Scouts demonstrate training

Suit Is Dismissed

The court of chancery of Great Britain has dismissed the suit brought by the International Mercantile Marine Co. to enjoin the merger of Cunard and White Star line fleets.

The merger was opposed by the American company on the grounds that it did not conserve the interests of minority stockholders. Stock of the Oceanic company which operates the White Star line is held as collateral by the International Mercantile Marine Co. for money due in the sale of the Oceanic company to a British group in 1926 for $35,000,000.

The British court's decision apparently rests on the fact that the I. M. M. company is not the owner of stock in the Oceanic company; that it is merely an unpaid vendor; that it had no lien on the shares of stock and that it had agreed that these shares be vested in trustees.

What further action the International Mercantile Marine Co. may take in this matter is not yet established.

Performance in Service of Ferry Steamer Delmarva

Latest reports from the Virgina Ferry Co.'s twin screw steel ferry steamer DELMARVA, upon completion of her first 25,000 miles of service, indicates a most interesting performance and business record. Articles describing this vessel will be found in the January, February and April issues of MARINE REVIEW.

The DELMARVA was delivered on Jan. 5 by her builder, The Pusey & Jones Corp., Wilmington, Del. and placed in service betwen Norfolk and Cape Charles, Va. on Jan. 7. In this period to May 14 inclusive, she delivered 25,480 service miles.

Under all conditions, the DELMARVA readily makes the 26-mile run in her scheduled time of 1 hour 45 minutes, though on one leg of her trip she has two turnings to make and must proceed under half speed for approximately 6 miles of the 26. She has no difficulty, in fact, in making her scheduled time with only one of her two Babcock & Wilcox boilers delivering steam.

While preliminary estimates on fuel consumption called for 1 pound of oil per shaft horsepower per hour, actual consumption has been comfortably below that figure. Actual fuel oil consumption for all purposes has averaged 4500 gallons per 24 hours. The Skinner unaflow engines have proven free from trouble of any kind and exceptionally low in lubricating oil consumption; in maneuvering, officers of the vessel find them nimble and responsive and more satisfactory than ordinary triple expansion engines.

The DELMARVA, since her introduction, has enjoyed a steady increase in business. Comparing April with the initial month, January, passenger travel has increased 50 per cent and vehicles 80 per cent.

River Towboat Converted

The New Orleans plant of the Todd Shipyards Corp. recently completed an elaborate remodeling and reconditioning of the steel river towboat ILLINOIS for the Federal Barge line of the Inland Waterways Corp. Trials, after completion of the work, indicated that her conversion from stern wheel to screw propulsion and from pulverized coal burning to oil burning had been a complete success. Her twin propellers operate in tunnels and each propeller is direct connected to a steam engine developing 1200 horsepower.

Dimensions of the ILLINOIS are: 231 feet in length overall; 58 feet in beam; 8 feet in molded depth; 6 feet in draft; and the displacement on this draft is 1790 tons. The ILLINOIS is said to be the most powerful towboat on the Mississippi river.

Diesel Direct Drive Selected in Rebuilding Ferry

PLANS for rebuilding of the passenger ferry PERALTA formerly owned by the Key System Transit Co., Oakland, Calif., have been prepared by the Puget Sound Navigation Co., Seattle.

The PERALTA was built for the Key System Transit Co. in 1927 as a passenger ferry for use between Oakland and San Francisco. In the fire which destroyed the Key Systems' Oakland mole, this ferry was in one of the slips, but on account of the boilers being cold, could not be moved and she burned to the main deck.

Built as a double ended ferry, the PERALTA was driven by independent direct current electric motors. The turbo-electric generator unit was of a capacity to supply the necessary power for the 2600 shaft horsepower on the propelling shaft for the two hours on the duty cycle and for 2250 shaft horsepower on the propelling shaft for continuous duty. In regular service the boat was operated at about 1500 shaft horsepower on the propelling shaft.

During the speed trials a maximum speed of 15.15 knots was obtained.

The hull of this ferry and most of the machinery did not suffer any damage at all and was purchased by the Puget Sound Navigation Co. to be rebuilt into a single ended vehicle and passenger ferry.

The management of the Puget Sound Navigation Co., recognizing the demand in modern transportation for faster and more frequent service, decided that the rebuilt ferry should have a working speed of 17½ knots. To obtain this it was necessary not only to increase the shaft horsepower, but also to decrease the displacement tonnage.

Based on the company's experience with the 2200 shaft horsepower motor ferry CHIPPEWA, in service for 23 months without missing a day and with a record of more than 10,000 hours of operation in which she has traveled over 160,000 miles and during which time the engine responded over 90,000 times without fail, a 3000 brake horsepower. Busch-Sulzer 10-cylinder, single-acting, trunk piston, diesel engine of the same type was selected.

Plans call for an entirely new superstructure arrangement with an automobile capacity of 110 cars on the main deck and a passenger seating capacity of 1500 on the upper deck. The beam over all will be reduced from 70 feet to 56 feet 6 inches which will still allow for three lanes of cars on either side of engine room casing.

A careful study was made with regard to power plant equipment and arrangements, and consideration was given to the original turbo-electric double ended drive, turbo-electric single ended drive, diesel electric single and double ended drive, and diesel direct single ended drive. Diesel direct drive was chosen because it was found to make the desired speed increase possible and to give the highest possible operating economies. It also resulted in the simplest possible machinery installation.

Comparison of Machinery Weights

As can be seen from the tabulation of machinery weights, given below, the 3000 shaft horsepower Busch-Sulzer trunk piston engine reduces the weights 36 per cent and at the same time a 33 per cent power increase is effected.

(a) Steam electric double ended drive 2250 shaft horsepower continuous with 200 kilowatts auxiliary turbo generator unit. Weights are given in pounds.

4—Boilers (dry)	394,000
1—Main turbo generator unit complete	112,150
1—Auxiliary turbo generator unit complete	16,800
1—Condenser (dry)	38,750
Control and switchboard	18,100
Cables, conduit and wiring	30,000
Piping, valves, pumps, air ejectors, fuel oil heaters, feed water heaters, etc.	45,000
2—Double armature propelling motors	181,600
2—Propellers, shafting and bearings	45,000
Normal fuel (½ bunker capacity)	255,000
Normal fresh water (½ bunker cap.)	172,000
Total weight in pounds including normal fuel and water *ready for service*	1,308,400
Machinery weight excluding fuel & water	881,400
Total weight per propeller shaft horsepower ready for service	581.5
Weight per propeller shaft horsepower excluding fuel and water	391.7

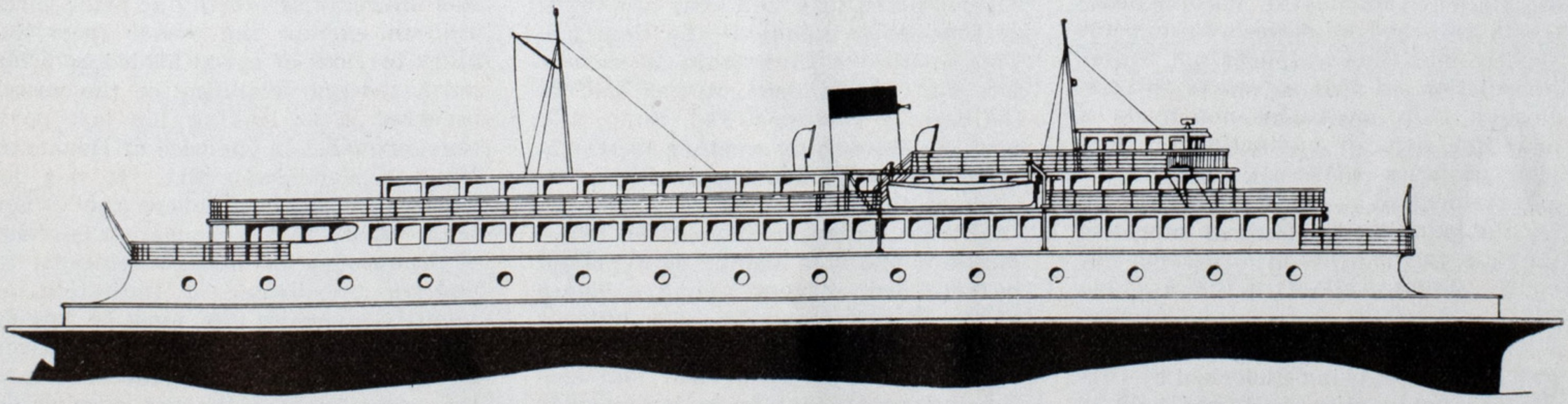
In addition to above, two trim tanks of 60 tons capacity are provided at each end of boat.

(b) Diesel direct drive, single ended 3000 shaft horsepower continuous with 400-kilowatts auxiliary generator unit (all fresh water cooling). Weights are given in pounds:

1—Propelling unit with standard equipment, blower with motor	253,000
1—Propeller, shafting and bearings	40,000
2—Starting air tanks	48,000
Oil and water cooler	24,000
Pumps and motors, etc.	63,500
Piping, filters, strainers	20,000
1—Combination exhaust & oil fired boiler	16,000
1—Auxiliary diesel generator unit, 400 k.w. with subbase	116,500
Platforms and stairs	3,000
Switchboard, wiring, transformers	7,500
Fuel oil (one week's supply)	150,000
Fresh water	110,000
Total weight *ready for service*	851,500
Machinery weight excluding fuel & water	591,500
Weight per propeller shaft horsepower for service	283.8
Weight per propeller shaft horsepower excluding fuel and water	197.1
Saving in weight, diesel direct drive over turbo-electric double ended drive, ready for service, pounds	456,900
Saving in weight, diesel direct drive over turbo-electric single ended drive, ready for service, pounds	334,000

(Continued on Page 40)

This article is an abstract of an announcement issued May 1, 1934, by the Busch-Sulzer Bros. Diesel Engine Co., St. Louis.



Proposed outboard profile of diesel drive ferry as reconstructed from the ferry steamer Peralta

Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review
By Harry Bowne Skillman
Attorney at Law

EVIDENCE in the case of COASTWISE, 68 F. (2d) 720, showed that a steamship proceeded down the Elizabeth river for ten minutes after seeing another vessel, which she knew would have to back before proceeding down stream ahead of her, when over a mile away, and that she put her engines full astern only a minute before colliding with the other vessel. The court held that the steamship was at fault, applying the principle that when the fault of one vessel is gross and the fault of the other doubtful, the former should bear the whole loss.

* * *

IT IS not negligent to place a barge in a slip constantly frequented by many other barges without inquiring whether its waters contain hidden dangers. The tug may be bound to ascertain whether there is enough water in the slip for barges of the draft she is mooring, and is, of course, chargeable with such information as harbor charts disclose, but she has a right to assume that a slip crowded with barges does not have such defects as broken piles in one berth when the adjacent berths are occupied by barges that lay in them safely. A tug may shift a barge to another convenient berth whenever she obstructs the course of navigation, but this right must be exercised with care and caution and only when reasonably necessary and for the purpose of temporary removal.—GILDERSLEEVE No. 339, 68 F. (2d) 845.

* * *

SHIP mortgage act will not be construed to extend to mortgages securing loans of money intended and actually used for nonmaritime purposes, in the absence of express provision. It does not conflict with rights of state tribunals to enforce contracts governed by state laws and not strictly maritime and does not confer jurisdiction on federal courts to foreclose a ship mortgage, not made a maritime lien for navigation or shipping purposes. The only remedy for enforcement of a mortgage on a ship for nonmaritime purposes is a sale of the ship on the order of a common law court.—THOMAS BARLUM, 68 F. (2d) 946.

* * *

STEAMSHIP being undocked by tugs was not negligent, it was held in the case of ELIZABETH M. BAKER, 69 F. (2d) 54, in putting her engines full astern, as was customary, where the tug's hawser broke and the steamship's stern struck a moored barge. The barge being struck only one minute after the hawser broke, the steamship was not negligent in putting her helm hard-a-starboard with engines reversed to counteract the tide; nor was the steamship blameworthy in starting out with boats at the end of the pier where boats would not have interfered if the hawser had not broken. The steamship was not obliged to anticipate the breaking of the hawser.

* * *

IN THE case of KOOKABURRA, 69 F. (2d) 71, it appeared that the damage to the cargo involved, when a barge struck the falsework of a railroad pier and sank, was caused by the fault of two towing tugs belonging to the same owner and of the railroad. The court held that the damages were assessable one-third against each tug and one-third against the railroad, rather than half against the owner of the two tugs and half against the railroad.

* * *

PRINTED conditions on the back of a standard form attached to a steamship ticket, relating to notice of claim for injuries and time for bringing suit, not referred to in the ticket proper or on the face of the standard form, was merely a notice, said the court in the case of Baer v. North German Lloyd, 79 F. (2d) 88, and was not available to defeat a personal injury action by a passenger unless distinctly brought to the passenger's knowledge.

* * *

DECKHAND dunnage to be seaworthy must be laid so that the superimposed load will bear as evenly as practicable upon all the dunnage. This applies to thwartship as well as fore and aft dunnage, it was said in the case of INDIEN, 5 Fed. Supp. 349. And in determining whether seaworthiness of a vessel was impaired by overloading, the plimsoll mark placed on the vessel after mathematical determination of a safe loading point should be regarded as very strong evidence of the vessel's capacity. The efficacy of the plimsoll mark should not be destroyed except upon clear and convincing proof that it is erroneously placed or that specific facts warrant a finding that loading the vessel so as to submerge the plimsoll mark did not render the vessel unseaworthy.

* * *

NO RECOVERY can be had for the death of a seaman from typhoid fever contracted on ship, in the absence of a showing of some negligence as the result of which the fever was contracted—Goodrich v. United States, 5 Fed. Supp. 364.

* * *

IN THE case of American Scantic Line v. United States, 5 Fed. Supp. 410, the court decided that the burden of proving that a wreck without fault of the shipowner as respected the government's liability for the care of destitute seamen rested upon the government; that the owners of a wrecked vessel transporting members of the crew to the United States were entitled to recover transportation charges from the government regardless of the ownership of the wrecked vessel; and that owners voluntarily spending money for subsistence and necessaries for the crew were not entitled to recover the amount expended from the United States.

* * *

NOTICE by the war department requiring floating plants to display wooden arrows indicating course to be following in passing plants was nugatory as applied to a river dredge, it was declared in the case of FLYING BY, 4 Fed. Supp., 884, the power to establish rules for day signals on such dredges being in the commerce department.

* * *

FACT that vessel, contemplating taking on cargo at several ports and unseaworthy when leaving last port, was allegedly seaworthy at prior ports did not exempt the owner from liability for loss of cargo loaded at prior ports, though stranding of the vessel occurred after leaving the last port, the court held in the case of HORAISAN MARU, 5 Fed. Supp. 311. It was decided, further, that where the owner of a vessel is a corporation, privity or knowledge of unseaworthiness, to deprive the owner of limitation of liability for cargo loss, must be privity or knowedge of the managing officer or agent, the test being the extent of the person's authority, not whether he is technically an officer.

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April, 1934	288	1,599,185	274	1,477,492
March	302	1,706,307	313	1,757,221
February	265	1,481,004	267	1,508,905
January	266	1,649,590	284	1,629,438
December	263	1,496,477	291	1,576,199
November	243	1,257,443	277	1,452,269
October	278	1,573,534	268	1,487,369
September	294	1,847,558	289	1,771,847
August	315	1,884,475	316	1,928,611
July, 1933	311	1,719,502	277	1,536,284

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April, 1934	67	199,032	48	147,083
March	59	162,480	48	140,311
February	42	129,940	36	109,973
January	45	139,259	47	133,427
December	54	175,715	45	135,969
November	47	144,111	40	119,896
October	68	186.588	51	152,700
September	65	182,418	44	126.290
August	61	181,283	61	178,894
July, 1933	69	203,042	53	151,781

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April, 1934	86	309,725	58	227,404
March	88	304,604	64	259,406
February	71	247,077	46	162,542
January	97	330,320	60	225,075
December	84	303,806	52	236,871
November	90	323,540	62	230,969
October	96	335,488	60	210.010
September	110	348,981	80	279,531
August	129	453,348	101	329,686
July, 1933	124	410,500	96	379,721

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April, 1934	14	20,555	15	20.572
March	13	33,399	13	33,399
February	11	27,213	11	27,213
January	9	22,908	10	25,570
December	13	31,801	13	32,589
November	15	29,335	18	35,579
October	14	27,953	14	32,913
September	15	26,225	12	28,028
August	16	28,877	18	32,727
July, 1933	11	24,324	9	23,063

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April,, 1934	3	4,985	1	2,022
March	5	17,973	2	7,422
February	7	20,959	2	6,882
January	2	7,694	.....	.....
December	5	5,089	2	8,350
November	3	8,568	4	12,794
October	4	13,606	4	9,730
September	2	4,430	5	13,279
August	6	11,862	4	10,186
July, 1933	3	6,171	2	9,465

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1934	32	121,085	50	186,817
February	25	95,774	52	198,593
January	32	116,610	50	188,401
December	31	119,833	51	184,646
November	29	108,890	35	130,457
October	26	102,926	46	173,030
September	25	97,576	38	141,839
August	22	83,506	34	129,908
July	26	99,339	29	111,559
June	20	78,651	34	120,089
May, 1933	25	98,688	28	105,115

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April, 1934	102	300,396	108	334,583
March	92	288,061	88	273,131
February	77	261,122	77	263,236
January	78	256,942	80	265,681
December	94	298,001	92	286,746
November	90	270,023	88	267,784
October	88	284,997	90	289,864
September	85	273,994	84	270,189
August	95	299,114	98	307,841
July	91	272,589	90	282,788
June, 1933	65	205,724	71	240,487

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April, 1934	21	65,701	47	125,291
March	23	64,469	60	151,360
February	16	47,708	41	102,933
January	22	68,930	41	112,922
December	17	57,307	42	119,186
November	19	55,692	49	115,584
October	16	56,239	49	125,591
September	15	47,575	35	89,775
August	17	52,764	44	106,570
July, 1933	22	32,472	41	99,668

Jacksonville

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April, 1934	10	10,464	7	12,164
March	9	16,338	9	11,193
February	8	10,900	11	20,348
January	7	13,017	10	22,508
December	8	15,083	11	22,837
November	8	13,405	8	19,108
October	11	24,365	6	8,893
September	8	11,528	7	13,086
August	7	12,477	7	13,152
July, 1933	13	22,553	11	25,670

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April, 1934	28	36,197	21	36,066
March	24	38,052	23	37,658
February	23	36,476	24	36,523
January	25	39,966	22	38,764
December	22	38,764	22	38,764
November	23	33,556	22	31,330
October	22	37,180	23	39,878
September	22	38,648	23	38,659
August	18	33,210	18	32,716
July, 1933	24	39,400	22	37,180

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April, 1934	113	254,839	103	239,371
March	115	275,629	129	309,123
February	115	268,707	112	251,232
January	118	282,972	125	298,570
December	123	279,151	109	253,209
November	114	260,755	114	249,344
October	118	247,474	124	297,436
September	116	265,547	113	266,183
August	100	223,940	102	203,716
July, 1933	110	221,610	114	236,622

Seattle

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April, 1934	62	264,608	67	278,172
March	52	203,796	51	205,371
February	54	226,118	62	251,281
January	52	221,000	55	230,995
December	54	225,842	60	246,987
November	54	222,914	51	211,474
October	58	253,865	59	254,959
September	35	154,233	40	174,263
August	40	183,028	41	182,626
July, 1933	40	168,770	40	169,815

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April, 1934	169	487,655	170	475,121
March	155	422,855	166	449,394
February	151	446,952	145	414,515
January	146	423,759	145	414,918
December	139	398,112	152	443,496
November	148	439,238	152	430,631
October	154	467,332	169	506,324
September	154	443,981	168	470,271
August	144	420,570	151	429,183
July	169	468,111	184	493,775
June, 1933	147	422,280	146	422,235

Charleston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April, 1934	38	101,315	34	96,705
March	44	131,839	37	109,492
February	40	112,884	39	109,597
January	23	60,138	25	66,827
December	35	111,420	32	97,473
November	43	123,628	39	109,151
October	34	97.585	33	91,526
September	42	116,048	32	83,944
August	33	92,987	27	76,881
July, 1933	35	102,115	29	82,742

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April, 1934	27	50,294	82	219,283
March	29	54,379	94	264,101
February	22	41,945	77	236,784
January	23	43,664	86	252,595
December	19	40,552	90	279,537
November	16	37,590	85	262,800
October	21	44,388	104	304,402
September	10	19,602	94	277,642
August	19	44,012	69	205,442
July	22	33,718	77	213,821
June, 1933	27	56,231	79	227,842

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April, 1934	186	696,716	167	679,883
December	169	639,444	164	629,462
November	143	539,624	162	592,724
October	160	623,572	152	592,212
September	154	562,597	152	561,294
August	156	578,255	156	605,610
July	165	641,116	152	601,731
June	189	670,782	171	671,704
May	190	600,184	185	630,905
April, 1933	178	625,508	190	614,741

San Francisco

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April, 1934	165	831,501	169	729,273
March	150	659,251	181	772,219
February	141	503,105	154	659,366
January	163	722,800	197	764,823
December	137	616,820	172	739,604
November	144	619,874	182	806,020
October	169	753,650	168	717,133
September	150	654,888	141	658,887
August	174	748,739	170	743,918
July, 1933	156	710,857	154	717,664

Houston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
April, 1934	31	121,318	40	155,327
March	23	89,200	39	144,546
February	22	88,094	26	99,931
January	23	88,164	37	128,773
December	18	65,566	31	109,206
November	14	49,486	30	106,943
October	28	105,818	41	151,872
September	20	70,827	27	89,893
August	22	91,240	31	117,641
July, 1933	33	122,722	40	153,173

Note: At the port of Philadelphia, additional vessels in the foreign trade (via other American ports) were 75 of 263,548 net tons entered and 77 of 259,755 net tons cleared for the month of April.

Latest Data on New Marine Work

Information on New Ships Ordered—Building and Repair Contracts Let—Shipping Board Loans Made, Authorized or Pending

SECRETARY of the Navy Claude A. Swanson announced on May 16, that construction of 12 destroyers, 2 destroyer leaders and 6 submarines, at an estimated cost of $40,000,000, will begin as soon as funds are made available out of the $1,322,000,000 public works allotment requested from congress by the President.

The new construction will constitute the first year's program under the Vinson naval building act which authorizes bringing the navy up to full treaty strength by the replacement of 102 ships within the next five years.

The work has not yet been designated to any private shipyard or navy yard. In line with recent navy policy and in accordance with the terms of the act, it is assumed that one-half of this work will be awarded to private shipyards and one-half to navy yards.

To Launch Patrol Boat

First of three 165-foot steel coast guard cutters to be built by the Lake Union Dry Dock & Machine Works, Seattle, the ATALANTA is scheduled for launching June 11. About 20 days later the second vessel will be ready to take the water. After the ATALANTA, estimated for completion about Sept. 1, leaves the ways the keel of the third craft will be laid. These vessels are to be propelled by twin Winton diesel engines of 670 horsepower each.

Aircraft Carrier Ranger

Trials of the new 13,800-ton aircraft carrier RANGER, over the Rockland Me., course during the week of May 6, conducted by her builder, the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., indicated that she would exceed contract stipulations both in speed and economy. Rear Admiral George C. Day, U.S.N., president of the naval board of inspection and survey, was reported to be highly pleased with the results. The RANGER is scheduled to be placed in commission at Newport News, Va., on May 26, and will be commanded by Capt. Arthur L. Bristol, U.S.N. Final trials under the naval board of inspection and survey are to be held in October shortly after which, it is expected, the RANGER will join the fleet.

The new aircraft carrier, though of only 13,800 tons displacement, compared with 33,000 tons for the LEXINGTON and SARATOGA, has a capacity for 72 airplanes, equal to that of either of the two larger vessels. While the LEXINGTON and SARATOGA were originally laid down as battle cruisers, and converted during early stages of construction to aircraft carriers, the RANGER was designed as an aircraft carrier with the added advantage of experience from the operation of other vessels for similar duty.

Arctees in New York

The S. S. ARCTEES, latest arcform ship to visit this country, and for which the designer Sir Joseph W. Isherwood & Co. Ltd. is also the manager, was open for inspection at her Brooklyn pier on May 22 and 23.

In addition to improved hull design, the propelling machinery is also of the most modern design of its kind. The single propeller is directly connected to a triple expansion steam engine equipped with a high pressure cylinder and poppet valves of the Lentz system, which is operated by superheated steam of high degree. Superheaters were supplied by The North Eastern Marine Engineering Co., England, licensee of The Superheater Co., New York.

Need Cost-Finding Formula for New Naval Work

The treasury and navy departments are giving joint attention to that portion of the Vinson act which provides that naval contractors under this act shall not make profits greater than 10 per cent.

In the first place, it now is quite clear that this restriction will apply only to new ships. It will not apply to contracts for materials for use in repairs and maintenance.

Setting up a method to compute the profits is proving a difficult task. What items of overhead, as well as operating expenses, will be included to ascertain the cost? To what extent can the statements of contractors be accepted under this law, and to what extent will it be necesary for the government to examine corporate affairs in order to make a thorough cost analysis? There yet is no clear-cut plan as to how to set up a cost-finding formula.

The Vinson act, according to some observers in Washington, distinctly encourages companies to organize new units for the purpose of bidding on and obtaining and executing contracts for new ships under this act. It is thought that this would result in the keeping of a separate set of books which would show accurately the results of executing the naval shipbuilding contracts, without being affected or confused by the results of other, separate operations. Of course, it is pointed out, there might be some temptation on the part of such contractors to shift to the new company a considerable share of the overhead of the parent company, but it is felt that the vigilance which now is being exercised in keeping track of government contractors would prove an effective preventative of any possible abuses along these lines.

Queen to Name Cunarder

The Cunard line has announced that its superliner No. 534 now under construction at the shipyard of John Brown & Co. Ltd., Clydebank, is to be launched on Sept. 26, and that Queen Mary has consented to act as sponsor at the launching ceremonies which are to be attended by the King and a notable group of invited guests.

Though no definite date has been set, it is now believed that the giant liner which was designed to be the largest and fastest afloat will enter service on the transatlantic run in the summer of 1935. She will have a length of over 1000 feet and her gross tonnage will be about 73,000. Her contract speed which is said to be 32 knots will enable her to cross the Atlantic in four days. If the name of the liner has been decided upon, it continues to be an official secret, though there are unofficial rumors that she will be christened the PRINCESS ELIZABETH.

Diesel Engine Installed

The wood tug PROSPER 84 feet long, built in 1898, and now owned by the Bellingham Tug & Barge Co., has been given a new lease of life by the scrapping of the former 225 horsepower steam plant and the installation of a 350 horsepower Atlas-Imperial diesel engine. The PROSPER is an ocean going craft and with the new rig has developed a speed of 11 knots. The wood hull was found in excellent condition warranting the expense of the new installation.

Orders Placed, Bids Asked By U. S. Engineers

The United States engineers office, Memphis, Tenn., has issued the following information:

A contract has been awarded the United Welding Co., Middletown, O., for 50 steel dredge pontons on its low bid of $16,750. The Chicago Bridge & Iron Co., Birmingham, Ala., has been awarded contract for 25 sections of steel ponton pipe, on its low bid of $19,900.

The same office also accepted the low bid of the Midland Barge Co., Midland, Pa., for the construction of two 31-foot steel hull motorboats at a total cost of $8620. Bids on this item were opened on April 17. At the same time, all bids received on April 17 for the construction of two 30-foot wooden work boats were rejected. Bids for this work were re-advertised under amended specifications issued May 3, for opening on May 17. No information is available at this time as to the final award of contract.

The Memphis office, on May 15, issued invitations for bids for the construction of three 55-foot, steel hull, diesel work boats, the bids to be opened on June 5. These boats are to be of single screw, tunnel type, propelled by geared diesel engines developing not less than 120 horsepower at 800 revolutions per minute. The gear reduction is to give a propeller speed of approximately 325 revolutions per minute.

The United States engineer office, at Philadelphia, will receive bids on May 28 for the construction, and delivery afloat ready for service, of two 36-foot cabin picket boats.

These boats are to be of wooden construction and will have a length overall of 36 feet; beam of hull molded, 9 feet, 1⅜ inches; and depth molded, 6 feet, 4¾ inches. The engine is to be either of the full diesel or oil burning type of six cylinders developing 140 brake horsepower at a maximum speed of 1100 revolutions per minute.

The United States engineer office, Louisville, Ky., opened bids on May 10 for constructing 50 steel pontons and 150 sections of electrically welded steel pipe. No information as to award of contract to date.

The United States engineer office at St. Louis will open bids on May 28 for one 45-horsepower, medium heavy duty, marine type gasoline engine, for installation in a 28-foot steel hull pushboat. This same office will open bids on the same day for three gasoline engine driven, four-stage, centrifugal grader pump units, delivering not less than 600 gallons per minute at a total dynamic head of 550 feet.

To Build River Towboat

The United States engineer office, Vicksburg, Miss., on April 24 issued specifications and invitation for bids, to be received until May 29, for the construction and delivery afloat of one steel hull, twin screw, diesel driven towboat.

Dimensions of this vessel are to be; length molded, 176 feet; breadth of hull molded, 38 feet; depth molded, 8 feet, 6 inches. There are to be two propelling engines of full diesel type and direct reversible. The engines will be either four cycle or two cycle. Each engine shall develop continuously 650 brake horsepower at 250 revolutions per minute. In addition to the main propelling engines there are to be two 75-kilowatt, 125-volt, direct current, full diesel driven generating sets.

Railroad Tug Improved

It is reported that the Pennsylvania railroad's diesel electric tug ELMIRA was returned to service in New York harbor on May 14, after extensive changes in power plant and cooling system which make her one of the most modern vessels in the port.

With the expectation of still further efficiency, the two Winton air injection engines with which she was formerly equipped have been replaced with two of the latest Winton engines of the mechanical injection type. Her cooling system has also been changed over to use fresh water instead of sea water, to eliminate excessive engine corrosion and to permit more accurate temperature control of the engines.

Test Steel by New Method for Navy Requirements

For the first time, the bureau of engineering, navy department has specified that the yield point of steel, other than stainless, shall be determined by the proof-stress method. The forged, nickel-steel, main propulsion shafts for the new 1500-ton destroyers are to be tested in this way.

It is believed that this method of testing will provide a more positive basis for establishing the factor of safety of these propulsion shafts.

The proof-stress method has for its basis a limited, permanent deformation of the test sample after removal of the tensile loading. The method first was applied by the bureau, last fall, to corrosion-resistant steel bars, rods and forgings.

Following is the bureau's specification covering the proof-stress test:

"The proof-stress shall be determined by means of an extensometer, and shall be that stress which produces a permanent elongation of 0.0002-inch in 2 inches after release of the load. The proof stress shall be determined by applying a load of at least 5000 pounds per square inch less than the required minimum proof stress and noting the permanent elongation, if any, after release of the load. Additional loads shall be applied in increments of 2500 pounds per square inch until the permanent elongation of 0.0002-inch in 2 inches has been exceeded. The last beam reading taken prior to the point where the permanent elongation of 0.0002-inch in 2 inches is exceeded shall be recorded as the proof load from which the proof stress shall be calculated."

Moore Steam Turbine Corp., Wellsville, N. Y., on April 20 made the low bid to the navy department, bureau of supplies and accounts, for 16 turbine-driven generators, 16 regulators and spares, for use on naval vessels now under construction on Puget sound. The price named was $505,830, delivered at Puget sound, or $497,549, f.o.b. Wellsville, N. Y.

Bunker Prices

At New York

	Coal F. o. b. per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
May, 18, 1934	5.63@5.48	1.35	4.79
April 19	5.63@5.48	1.35	4.79
Mar. 19	5.35@5.20	1.25	4.79
Feb. 19,	5.35@5.20	1.25	4.79
Jan 18,	5.35@5.20	1.25	4.79
Dec. 18	5.35@5.20	1.25	4.79
Nov. 18	5.35@5.20	1.15	4.70½
Oct. 18	5.00@5.75	1.15	4.70½
Sept. 18	4.45@4.75	1.15	4.70
Aug. 18	4.45@4.75	.90	4.32
July 18	4.30@4.60	.90	4.32
June 18, 1933	4.30@4.60	.80	4.08

At Philadelphia

	Coal trim in bunk per ton	Fuel oil alongside per barrel	Diese engine oil alongside per gallon
May 18, 1934	4.93@4.78	1.35	4.76
April 19	4.93@4.78	1.35	4.76
Mar. 19	4.65@4.50	1.25	4.76
Feb. 19,	4.65@4.50	1.25	4.76
Jan. 18,	4.65@4.50	1.25	4.76
Dec. 18,	4.65@4.50	1.15	4.76
Nov. 18	4.65@4.50	1.15	4.76
Oct. 18	5.00@5.75	1.15	4.76
Sept. 18	4.45@4.75	1.15	4.88
Aug. 18	4.45@4.75	.90	4.28
July 18	4.30@4.60	.90	4.28½
June 18, 1933	4.30@4.60	.80	4.04

Other Ports

May 18, 1934

Boston, coal, per ton	$ 7.86
Boston, oil, f. a. s. per barrel	$1.23
Hampton Roads, coal, per ton, f.o.b. piers	$5.00
Cardiff, coal, per ton	13s 6d
London, coal, per ton	—s —d
Antwerp, coal, per ton	15s 0d
Antwerp, Fuel oil, per ton	—s -d
Antwerp, Diesel oil, per ton	—s -d
British ports, Fuel oil	—s -d
British ports, Diesel oil	—s -d

Note: Figures given for coal at New York and Philadelphia are for Classes A and B according to the Code; Class C is slightly less.

To Install Contra Rudders On Twenty Vessels

After careful investigation, including model experiments and a check-up on the results obtained in actual service to establish increased efficiency, the American Hawaiian Steamship Co. has decided to install contra rudders on 20 vessels of the line at an expenditure of almost $250,000, which amount largely represents labor costs. This work is now under way and it is expected that all of the installations will be completed by September.

Experience with the contra propeller and contra rudder, the latter being a combination of the contra propeller and streamline rudder, is not something new with the American Hawaiian Steamship Co. For the past six years, by experiments at the United States model basin and then by checking the results in actual service over an extended period under all year around conditions, the company has definitely established to its own satisfaction the economies that are possible by the use of this device.

Model Experiments Conducted

The first step in the company's program of investigation was a series of model basin tests in the Washington tank with a 20-foot model of the S. S. DAKOTAN class of ships. The results of these tests at 10,500 tons displacement indicated a saving of 220 shaft horsepower or 17.7 per cent at 10 knots and a saving of 290 shaft horsepower or 13 per cent at 12 knots, with savings at intermediate speeds lying between these two sets of figures.

On the basis of the model performance a contra propeller was installed on the S. S. PENNSYLVANIAN. The performance of this vessel in actual service was then carefully observed. Averages of the performance of the PENNSYLVANIAN for three years prior to the installation and for four years after the installation, were found to be as follows: Before installation, speed, 11.63 knots, displacement 9045 tons, fuel consumption, 210 barrels per day. After installation, speed, 11.81 knots; displacement, 9642 tons; fuel consumption, 187 barrels per day. Adjusting the fuel consumption before installation to the average speed and displacement after the installation, the fuel consumption before installation becomes 229 barrels per day, or a difference of 42 barrels when compared with the fuel consumption after installation, which represents a gain in fuel economy, due to the contra propeller, of 18 per cent. The improvement over the results indicated by model basin experiments is attributed to better steering and reduced yawing in actual sea service.

About a year after the installation on the PENNSYLVANIAN, the American Hawaiian Steamship Co. took over the Williams line including the S. S. WILLHILO, renamed the ARIZONIAN which had been fitted with contra propeller shortly before. The average performance of the ARIZONIAN for seven voyages prior to the installation and for three years after the installation is given in the following results: Before installation, speed, 10.44 knots; displacement, 12,425 tons; and fuel consumption, 200 barrels per day. After installation, speed, 11.62 knots; displacement, 10,225 tons; fuel consumption, 200 barrels per day. The fuel consumption before installation, adjusted to the conditions after installation, was 242 barrels per day showing a fuel economy due to the contra propeller of 17 per cent.

The third vessel to be fitted with a contra rudder, the S. S. GOLDEN SUN, one of the transpacific fleet, from average performance for 18 months before installation and two years after installation, showed a gain in fuel economy of 15 per cent.

A complete article on the contra rudder fully illustrated giving details of construction and data on performance was published in the February, 1932 MARINE REVIEW.

The saving due to the use of this and similar devices may be realized in reduced fuel consumption for the same speed or increased speed for the original fuel consumption.

Orders received by the General Electric Co. during the first quarter of 1934 amounted to $38,148,654 compared with $25,511,644 for the corresponding period of 1933, an increase of 50 per cent.

Correction Is Made

In the item, page 45, April issue, referring to two pipe line dredges ordered by the United States engineer office, Kansas City, Mo., from the Marietta Mfg. Co., Point Pleasant, W. Va., it was erroneously stated that these dredges were to be similar to the JADWIN and BURGESS. They are to be similar to the dredges CAPT. MERIWETHER LEWIS and CAPT. WILLIAM CLARK, built by the same company for the same United States engineer office.

The general dimensions of the dredge CAPT. MERIWETHER LEWIS are: Length overall, 268 feet, 11½ inches; length between perpendiculars 260 feet; breadth overall, 84 feet, 8⅜ inches; breadth molded, 50 feet; depth molded, 8 feet, 6 inches; and draft, 4 feet.

The CAPT. MERIWETHER LEWIS has side paddlewheels driven by two tandem compound reciprocating steam engines developing 1500 horsepower.

Use of Diesel Engines by The United States Navy

In recent Washington reports to *Steel*, the navy's increasing use of and interest in the diesel engine is noted as follows:

Diesel engine manufacturers are in the sun and will continue to be for sometime to come. The navy, in general, is being dieselized. All navy small boats now are being powered with diesels. Large naval vessels are being equipped with diesel generator stand-by units for supplying electric current.

One basic adaptation of diesel engines is that of prime movers for all emergency generators in surface craft. Some 28 vessels recently placed under contract will be so equipped. Diesel engines are also being considered for driving generators for auxiliary power and lighting. A number of harbor tugs recently have been dieselized.

One of the most interesting diesel engines so far delivered to the navy is a 12-cylinder, V-type, 950-horsepower, 729 revolutions per minute, 8 x 10 inches, 2-cycle Winton engine. This engine is now undergoing tests at the engineering experiment station at Annapolis, Md. It is of welded, rolled steel plate construction and has an underslung crank shaft. This is the prototype of sixteen 16-cylinder diesel engines which the navy has ordered from Winton for powering four submarines now under construction.

In these tests, the navy is paying special attention to bearings. It is using precision bearings and needle bearings largely. The precision bearings are made by using a very thin layer of bearing metal with a heavy steel back. Antifriction bearings are being studied with a view of greater application in diesels. Tests are being made with roller bearings for the main and wrist pin bearings.

Cooling diesel engines by fresh water whenever practicable has been adopted by the navy. All investigations so far indicate that no additional weight is involved by such policy and the problems of maintenance and operation are greatly reduced.

Weight of diesels is being brought down in every way possible. Where castings are used, they are of the nickel, chrome or molybdenum series, to permit thin sections. Aluminum pistons are used throughout. All excess weight is carefully removed from the crankshafts and other moving parts.

The Marine Equipment Manufacturers association has submitted a proposed basic code of fair competition. A public hearing on this code, before Joseph Dilworth, deputy administrator, was to be held in Washington beginning on May 22 and continued until completed.

Equipment Used Afloat and Ashore

Refrigeration — Motors — Welding Repairs — Coupling — Band Saw — Fire Extinguisher—Bearing Bronze—Streamline Fittings—Reclosing Device—Seal

ONE of the many interesting features of equipment installed on the Grace liner SANTA ELENA is a DeLaval emulsor, the function of which is to recreate fresh milk and cream by putting the component parts back together again by means of the same centrifugal force which originally separated them in the dairy. It is the sixth installation of the kind on Panama Mail ships and it is said that the product of the mechanical cow is in no wise distinguishable from that of the stall-fed species.

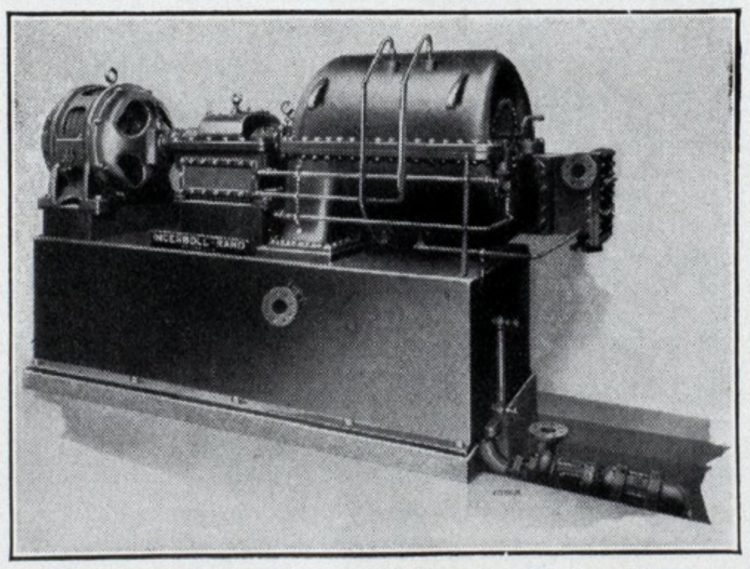
A supply of milk and cream acceptable to the taste of passengers has long been a problem to the steward's department of steamship companies and many of the expedients tried, some of them at great expense, have been totally unsatisfactory. Particularly has this been true of vessels in tropical service or on long voyages. The emulsor installation, therefore, is a valuable service feature, producing milk and cream of real "shore" standard, at a substantial saving.

The steamship company merely buys, in a favorable market, sweet butter and skim-milk powder, which can be stored indefinitely. These products, when reunited in the emulsor with the proper proportion of water, produce what is essentially fresh milk and cream; which it shall be is determinable at will. The usual practice is to produce milk with butter-fat content of 4 per cent one day, and on the next cream of 20 per cent butter-fat content; so that neither product is more than two days old when consumed.

The SANTA ELENA'S emulsor uses but little galley space: floor area of only about 3½ x 3½ feet, and an overall height of about 6½ feet. The process of emulsification is quite simple: Placing the skim-milk powder in the especially constructed vat with the necessary water, sweet butter is added in the predetermined proportions and the mixture gently agitated until thoroughly liquefied. The liquid is then heated to a pasteurizing temperature of 143 degrees Fahr. to 145 degrees Fahr. and held there for 30 minutes, after which it is run through the emulsor. This machine, revolving at high speed, forces the liquid mixture outward by high pressure and through paper-thin openings between a series of plates which form the top of the bowl. The component parts thus are thoroughly united, forced through the finest of orifices in a mist-like spray, and then discharged from the receiving covers as fresh milk or cream, without trace of artificiality. This milk or cream is immediately cooled to below 50 degrees Fahr. and has approximately the same keeping quality as ordinary fresh cow's milk. Among the first merchant ship installations of the emulsor to be made in this country were those on the Panama Mail steamships GUATEMALA and EL SALVADOR, which have now been followed by those on the four new "SANTA" ships of the same line. Fresh milk, formerly taken on at the Panama canal, cost 80 cents a gallon, while the emulsor produced it for 18 cents a gallon, and the 20 per cent cream for table use costs but 60 cents a gallon to produce.

Water-Vapor Refrigeration

A SYSTEM of water-vapor refrigeration has been successfully developed by the Ingersoll-Rand Co., 11 Broadway, New York. Water itself is the refrigerant and no chemical is needed. A small percentage of the water is evaporated at high vacuum and the vapor is compressed by either steam jet boosters or a centrifugal compressor and discharged to a condenser. The centrifugal water-vapor unit of this type is shown in the accompanying illustration. This unit consists of three principal parts: An evaporator in which the water is cooled by evoporating a small percentage of water into vapor at very high vacuum. A compressor of either the steam jet booster type or centrifugal type, as shown, which compresses the water-vapor and discharges into a condenser. And, third, the condenser which is of either surface or direct contact type in which a vacuum of about 28 inches of mercury is maintained with a natural or artificial supply of condensing water. In addition there are an auxiliary air pump for the condenser, a chilled water pump; and a condenser pump.



Centrifugal Water-Vapor Refrigerator

In the centrifugal water-vapor unit, the evaporator is built into the base of the machine, water being admitted under return pressure and removed by a chilled water pump. Water vapor is compressed by the multi-stage centrifugal compressor mounted directly above the evaporator and is discharged into a small surface condenser bolted directly to the compressor discharge nozzle.

The compressor may be driven through a step-up gear by a motor as shown in the illustration or directly by a steam turbine. No speed variation is necessary for regulation and constant speed turbines or induction type motors may be employed.

The centrifugal water-vapor unit has the feature of automatically reduced power consumption at partial loads when operating at constant speed. As the tonnage demanded decreases, the evaporation temperature goes down and the horsepower decreases approximately in proportion to the tonnage.

Units are built in standard sizes from 50 to 300 tons of refrigeration. Ratings depend upon chilled water temperature and cover a wide field of temperature, capacity and condensing water conditions.

Self-Protected Motor

A SELF-PROTECTED motor which cannot burn out has been developed by the Lincoln Electric Co., Cleveland. This motor has a protective device built into the winding. If the motor is stalled through overloading, or becomes excessively hot due to poor ventilation, or if it runs on single phase, or if it is blocked for any other reason, the protector automatically shuts off the current and the motor is saved from damage.

In the use of this self-protected motor, less supervision is necessary and since the possibility of damage is remote, repairs are reduced to a minimum. Also, frequently a smaller size of motor can be used, especially is this true where only infrequent peak loads necessitates a larger size of motor.

These motors, of alternating current, induction type, are built in sizes from one-half to 30 horsepower, for either two or three phase and standard commercial cycles and voltage. Controls are mounted on the motors.

Large Bucket Is Saved by Thermit Welding

A FRACTURED bail lug recently put the bucket of the dredge CREST, belonging to the Great Lakes Dredge & Dock Co., out of service. The huge bucket, with a capacity of 14 cubic yards, would have been costly to replace, and the making of a new bucket would have meant weeks of delay. At the same time, repair, by most methods presented many difficulties. For thermit welding, however, the job was a comparatively simple one and involved merely the making of a new forging to take the place of the part which had carried away and the welding of this forging to the frame of the bucket.

The repair was made by an operator of the Metal & Thermit Corp. with the help of a small crew, recruited from the yard forces of the Great Lakes company. The new forging was first placed in position and carefully aligned. Then, a wax pattern was applied and the next steps were the building of sheet iron mold box, the ramming of the mold and the usual preheating, in this case requiring 6 hours. The thermit was then reacted and poured and, after the weld had cooled thoroughly, the mold was removed and the job completed by cutting away the gates and risers. The bucket may now be considered as good as new.

Welding repair to dredge bucket by thermit method

A Four-Duty Coupling

TO TAKE its place with other products in the line of general transmission equipment manufactured by The Falk Corp., Milwaukee, Wis., this company has developed the Falk-Rawson four duty coupling. This coupling performs four important duties—it starts, couples, cushions, and limits the load.

The new coupling makes possible substantial savings in electrical equipment such as motors and controls, and protects the machine driven by affording smooth gradual starting and cushioning of overloads. It will save electrical power by reducing inrush current and allowing the selection of smaller motors operating closer to their maximum capacity. In addition, it eliminates the need of shear pin couplings while fulfilling the functions of a flexible coupling and in other ways increasing the economy and efficiency of the drive.

The primary function of the new coupling is as an automatic starter, centrifugally operating. This function is accomplished in a simple way. Essentially the construction involves merely two drum shaped members, one attached to the driving shaft and the other to the driven shaft. Between driving and driven members are inserted two sets of floating segments, made usually of brake lining reinforced with lead; the amount of lead being calculated to give the required centrifugal pressure for carrying the load.

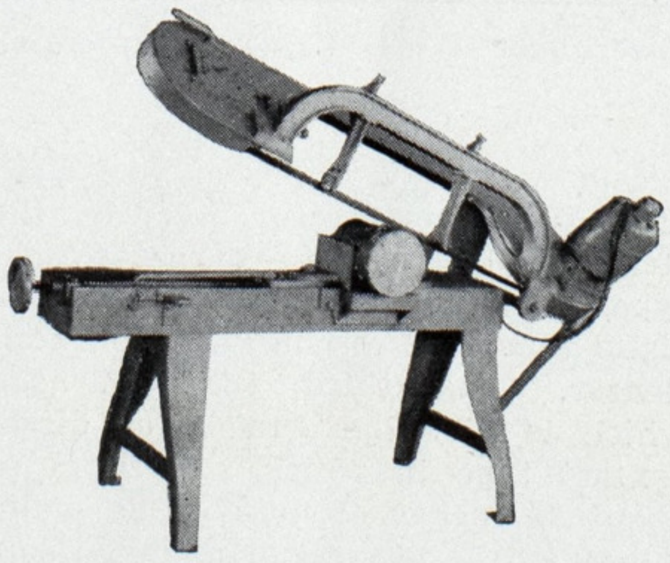
Metal Cutting Band Saw

THE band saw principle is just as advantageous for cutting metals as for wood. The more general adoption of such saws has only waited the development of a saw of this type especially designed and built for metal cutting. The Wells band saw, manufactured by the Wells Manufacturing Corp. Three Rivers, Mich., now supplies that need.

A band saw produces maximum cutting speed for the simple reason that a continuous running saw is always cutting. In many comparative tests the cutting time with this saw has been one-half, one-third, or even less than with other types of equipment. Typical experience is the cutting of 1½-inch round cold rolled machine steel in 47 seconds.

Blade Cost Is Reduced

Blade cost with this saw is said to be only a fraction of that usually experienced because the full length of the blade is used and blades with long life in this service are now available. When cutting soft metals other than cast iron the blades seldom become dull throughout their entire life.



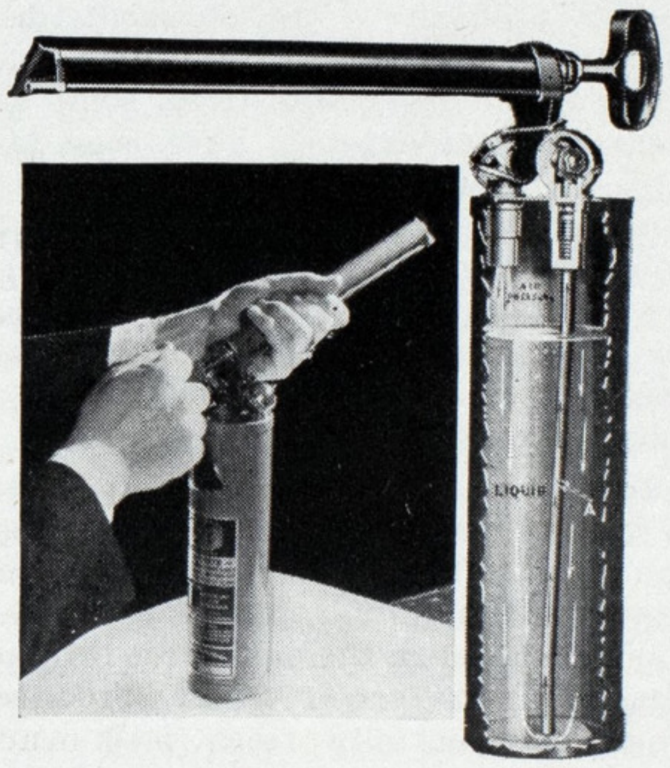
Band saw for cutting metal

A New Fire Extinguisher For Quick Service

A UNIQUE new type of fire extinguisher manufactured by the Wil-X Manufacturing Corp, 29 Ryerson street, Brooklyn, N. Y., overcomes the disadvantages of the old style hand-operated extinguishers.

This new "machine-gun" extinguisher has the pump on the outside of the cylindrical container where it cannot gum up, jam, or corrode. The pump never comes in contact with the liquid, only compressing air which forces the liquid out under high pressure. A quick lift of the pump, and the new extinguisher supplies a steady stream of liquid directly at the base of the flames.

It is easier to aim, and operates with accuracy. Its liquid will not leak or evaporate, for it is hermetically sealed when not in use. The liquid is an absolute non-conductor of electricity, and will also withstand a temperature of 52 degrees below freezing.



Quick acting fire extinguisher

Bronze for Bearings

A NEW form of bearing bronze, semi-finished outside and inside, has been developed by the Magnolia Metal Co., Elizabeth, N. J.

An important feature of this material is that the inside surfaces are semi-finished as well as the outside. By this process the user of the material will avoid the inconvenience and delay sometimes caused by hidden blow holes, sand spots or cracks which might show up on the inside of the bushing when it is being machined to the final dimensions.

In the manufacture of the new bearing bronze bar stock, care is taken in semi-finishing to maintain full dimensions giving one-sixteenth inch extra metal both outside and inside for final machining. It is therefore possible to order actual sizes which incorporate the small additional amount needed for machining.

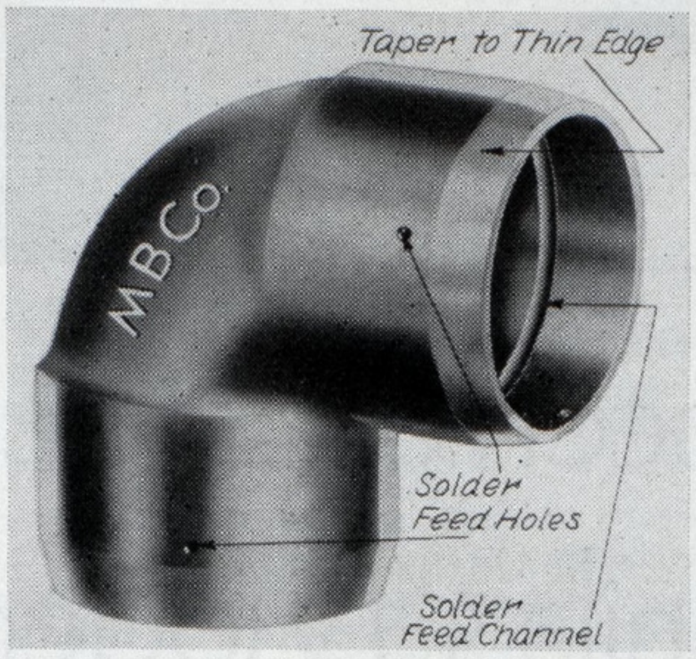
Streamlined Fittings Used for Marine Service

ONE of the many innovations on the recently commissioned ferry steamer DELMARVA is the use of copper pipe and fittings on certain of the water and service lines, notably the bilge suctions, hot and cold water and sanitary plumbing lines. Sizes installed range up to 2½ inches.

This installation is of the patented "streamline" type, designed for soldered instead of screwed joints, and is the product of the Mueller Brass Co., Port Huron, Mich. Distinct advantages are claimed for the "streamline" fitting as compared with either the flared or threaded fitting, one of the chief of which is the ability to utilize a hard copper pipe, thus permitting reduced wall thickness without impairment of strength or safety factor while assuring a smooth, straight job of piping, free from kinks and sags. In this way, a tensile strength of 55,000 pounds per square inch is attained instead of 30,000 to 32,000 pounds, as in annealed or soft copper.

The streamline fitting, shown in the accompanying illustrations, is quite different from any previously used jointure. According to the manufacturer, a long series of tests made by the Underwriters Laboratories Inc., and the National Board of Fire Underwriters, prove conclusively that a joint made with streamline pipe and fittings is actually a perfect bond of pipe, solder and fittings. The design of the fitting is clearly illustrated, including the machined bearing surface, the solder feed channel and the drilled solder feed hole. The distance to which the pipe may be inserted in the fitting is made positive by a shoulder in the fitting itself against which the pipe rests, and which is practically as high as the pipe is thick, thus reducing flow resistance to a minimum.

Close tolerances between the pipe and fitting are maintained, so that the pipe fits snugly, and capillary attraction is utilized to bring about a perfect union between pipe and fitting. The surfaces to be joined are coated with flux and assembled, the assembly is moderately heated with a plumber's torch or acetylene blowpipe after which the solder (in wire form and of special composition) is applied to the feed hole until a drop melts and at once is drawn through the hole and into the groove. Instantaneously, the solder coats every portion of the joint and appears at the outer edge of the fitting around the full circumference of the pipe as a continuous silver ring giving a completely bonded jointure of maximum strength. It makes no difference whether the feed hole is located top, side or bottom in the assembly; capillarity distributes the solder with

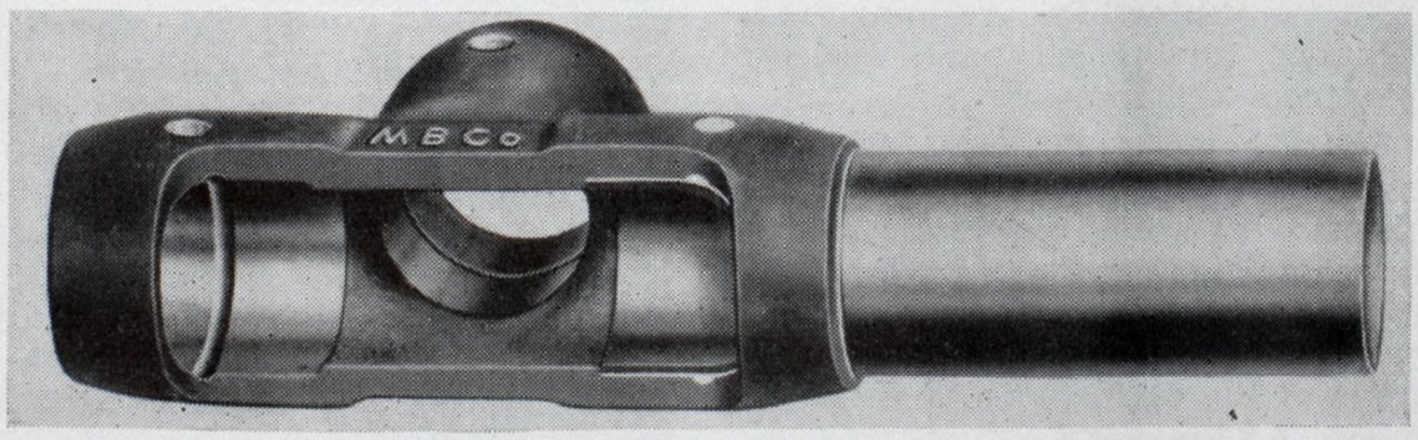


A streamline fitting

equal facility, a great advantage when working in confined spaces.

For marine and aviation work, where resistance to vibration is a requisite, particular advantages over screwed joints are claimed. Vibration in a streamline installation is harmlessly dissipated over the entire system and not localized at any one point. Entirely aside from their essential qualification of corrosion resistance and lesser weight, it is pointed out that the glass-smooth internal passages have been found by test to reduce flow resistance by 27 per cent.

Shipyards throughout the country, including Pusey & Jones, Great Lakes Engineering Works, Defoe Boat & Motor Works and various others, have made streamline installations on yachts and sea-going vessels for plumbing, hot and cold circulation, waste, fuel oil, low pressure steam, air and refrigeration lines. Among these installatitons are represented 15 naval vessels, the ferry steamer DELMARVA several yachts and other vessels.



Sectional view of a three-way streamline fitting

New Reclosing Device for Oil Circuit Breakers

AN INEXPENSIVE, direct acting reclosing device, designated as type SM has been developed by the General Electric Co. for use with oil circuit breakers. This attachment will reclose a breaker one, two, or three consecutive times, with equal time intervals between reclosures, when the breaker is tripped by overload. If the overload disappears after any reclosure, the attachment will return to its normal position and the breaker will remain closed. If the overload still exists after the last reclosure, the breaker will remain locked open and it will be necessary to close it manually before any further automatic operation takes place.

The attachment is a mercury-tube device in which timing is obtained by running mercury through an orifice into a reclosing contact chamber. The tube has sealed-in contacts which do not deteriorate or require maintenance. The number of consecutive reclosures that the equipment will make and the time interval between reclosures is fixed during the process of manufacture. A new tube, however, can be readily substituted if a different number of reclosures or some other time interval is desired.

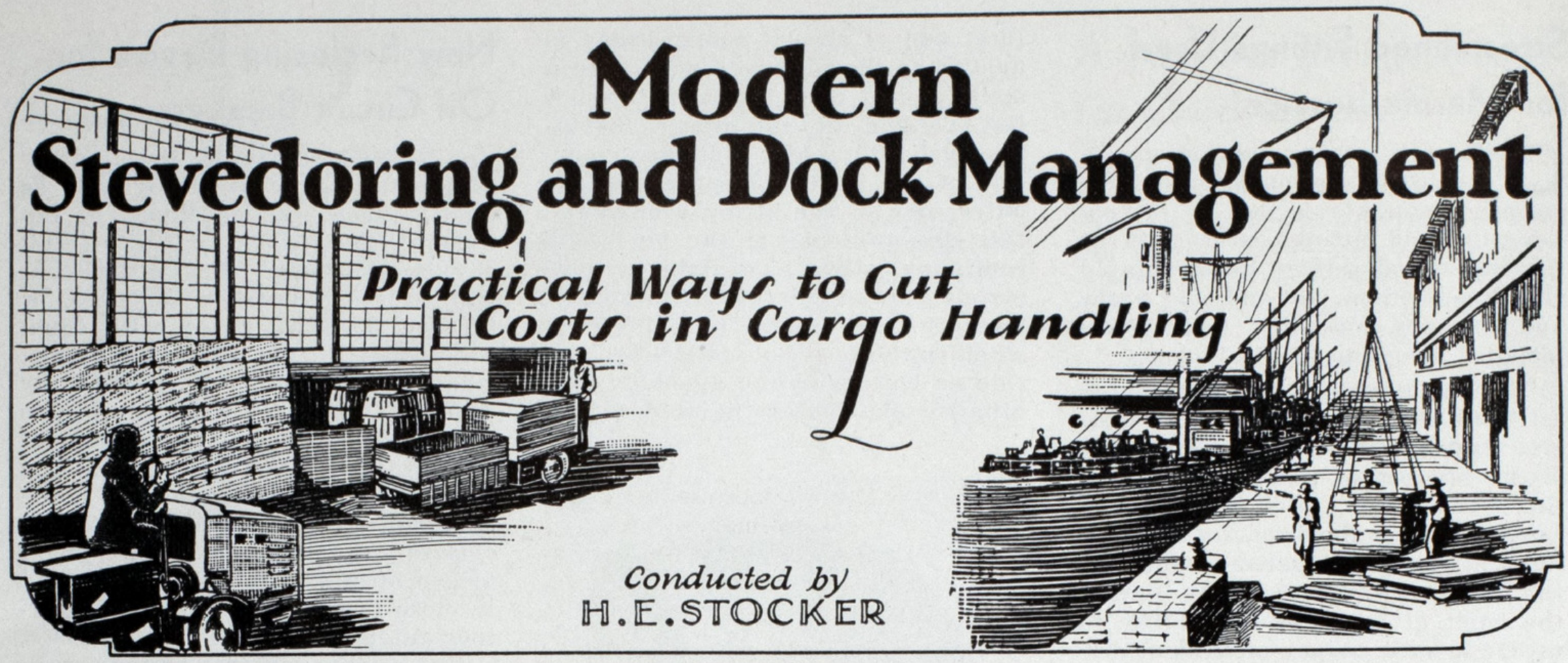
Directly connected to the breaker mechanism the attachment is available with both solenoid and motor operated breakers. It can be furnished with outdoor breakers and switch house equipments, it can also be supplied for use with indoor breakers which have various mountings such as pipe or angle iron framework and metal enclosed.

New Multi-Purpose Seal

A NEW universal sealing compound has been developed by the industrial division of the Ideal Commutator Dresser Co., Sycamore, Ill. This compound is non-soluble, non-corrosive, and non-oxidizing. It comes in a paste form, can be spread as thin as .001-inch, seals instantly, yet does not harden or become brittle.

When used in connection with gaskets, or without them, or as a seal for flanged or threaded joints in fuel oil, steam, water, air, gasoline, lubricating oil, or in any type or size of pipe line, this seal cannot be washed out. It is not affected by atmospheric conditions and is heat resisting up to 400 degrees Fahr. It prevents rust or corrosion, and may be applied on any material or surface. It seals as perfectly as shellac, it is said, and yet permits quick and ready disassembly at any time.

This new compound is free of grit and with its highly lubricant castor oil base is an effective rust-preventative for threaded connection. It also prevents corrosion.



Modern Stevedoring and Dock Management

Practical Ways to Cut Costs in Cargo Handling

Conducted by
H. E. STOCKER

Vessels Receive Efficient Service at Manila's Modern Pier

By Emmett J. Johnson

FOR general utility and variety of facilities pier No. 7 at Manila, P. I., is one of the finest in the world. It was built by the insular government at a cost of $4,500,000 and is of concrete construction throughout. Some of the longest concrete piles ever used—110 feet long—were driven in its substructure. The entire pier is 1400 feet long and 234 feet wide, with a transit shed 1253 feet by 160 feet. It has a wide apron which carries marginal railroad tracks, gantry cranes, and gantry passenger gangways.

The pier apron is 28 feet wide, and an additional 4 feet 6 inches to outer side of pier, along the cap log, clear of the gantry is used for dock bollards, ship's crew gangways, cargo safety nets and other obstructions that extend a few feet from the inshore side of a vessel when cargo is being worked. This is a very definite advantage when shifting the pier cranes and landing bridges from one hatch to another along the apron which can be done without interference to the working of the ship.

Ship Side Gantry Cranes

There are several of these ship side gantry cranes with capacities up to 15 tons. They reach from the holds of the largest ships to a distance of 50 feet inshore to hatches in the top of the transit shed for landing cargo where it may be picked up by cranes (sometimes termed "bridge cranes") which are installed inside of the transit shed. These shipside cranes are also used for loading barges and inter-island steamers with freight in transit. The cranes are half gantry with inner end resting on a rail placed in the wall of the transit shed. This leaves the entire pier apron free of obstructions except for one gantry leg near the string piece.

These apron gantry cranes were constructed by Wellman, Seaver, Morgan, and are electrically operated. The cranes are of the "whirler" type, set on large circular tracks with heavy king pins for protection from overloads. As the booms are raised and lowered as easily as the load is lifted, the utmost freedom of movement is obtained.

The transit shed has three open bays with two rows of posts, one on each side of the center bay. Over these three bays there is a system of four rows of 2-ton and 3-ton cranes, a total of 48 cranes. The center trusses for the crane tracks, down the center bay, are hung from the roof leaving all bays entirely free from obstructions.

There have been several different types of telpher and other overhead systems tried out at various ports, but this is believed to be the only one of this type for handling general cargo and which also gives a coverage of the entire floor of the shed.

The question of being able to pile general cargo by mechanical means entirely, has been worked on for some time at various ocean terminals. The single monorail system, with traveling crane machine and operator, has been installed at various ports where a long haul is encountered and where uniform packages are handled. Several such installations at the port of London are used for handling frozen meats from Argentine. These installations are not for stacking, but more for direct movement from ship to land carrier.

In one plan for a pier, which was never carried out, each side of the pier was to have five longitudinal tracks and five pairs of crossovers and 50 switches. The cost of the installation would have been more than $100,000. All of these tracks were proposed in order to have the overhead carrier reach every part of the pier deck and eliminate the hand truck.

Use of Overhead Cranes

There are other monorail telpher systems for handling cargo. However, it seems to be the consensus of opinion that the system has not fulfilled expectations because of its lack of flexibility and its cost of installation.

There is another such installation of overhead cranes, as that in Manila, in the cotton safes at the port of Manchester. Though these are comparatively small compartments, absolutely fire-proof, the cotton is stacked for storage as high as

the cranes will allow. This gives complete coverage of the entire floor at a reasonable cost of installation and is economically operated.

The equipment at Manilla is one of the most up-to-date and efficient for handling of general miscellaneous and uniform cargoes, for stacking cases as high as necessary in the transit shed and reaching every portion of the shed, and for stacking sling platforms one on top of another full loaded with small package goods or bag materials. There is also equipment for loading and discharging shippers' trucks. All of this work is performed through a space that is not otherwise utilized, due to being overhead. Some of the New York piers with their congestion of truck teams, and small industrial trucks, could be greatly improved by using this or some similar system.

This coordinated system of shipside gantry cranes, wide apron, marginal railroad track, overhead track through which the shipside cranes can land loads directly in the transit shed and within reach of the cranes within the shed, allows for several different and efficient movements of cargo from ship to land carrier or to transit shed storage, as enumerated in the following.

Railroad cars, with center just 12 feet from ship's side, are well within reach of the ship's gear and directly under the gantry crane. There is an overhead clearance above the car floor of about 18 feet, sufficient for the largest crates of machinery. The crane capacity is 15 tons. There is, however, a floating crane of 35-ton capacity for heavier weights.

There is sufficient room outside of the cars to place a platform, level with a box-car door, and land sling loads on the car door sill with either ship's gear or gantry cranes.

Slingloads may be landed direct to shippers' trucks parked on apron to inner side and clear of the tracks.

Tractors and Trailers

By using tractors and trailers the sling loads are discharged, with either ship's gear, or shore cranes, on trailers, hauled inside the transit shed, entering one door and passing under the cranes. Here the loads are lifted by the cranes and stacked. By using box hooks on each case, it is a simple matter to separate to various piles into consignees' marks, with one operation. This requires very few men; one to hook on, one to guide and unhook on top of the pile, and the crane operator. With small packages, bagged materials, tin plate, etc., the entire sling load is landed direct to the pile and the slings left on the load.

An exceptionally well organized system is that using either lift trucks and dead skids, or chisel trucks and pallets. The sling boards are lifted from the hold of the ship and landed either on dead skids, or the platform slings, lifted by the forks of the chisel trucks are used as dead skids themselves. In either event they are landed on the apron by the fall which when it returns to the hold takes an empty platform along with it. The truck comes along and lifts the skid or pallet and deposits it under the cranes within the shed, which in turn lift and place it on the stack.

Where it is necessary to separate packages the pallet or dead skid is placed in a central position, and arranged around this are several other pallets on which men separate the small packages by marks. When a pallet is filled with an individual mark, it is then taken by the crane to its correct pile.

By using shore cranes entirely, it is possible to take advantage of the hatchways in the transit shed to land the loads direct to the transit floor without use of rolling equipment.

When loading, the reverse operations prevail. As before, goods are handled direct from railroad cars and from shippers' trucks as they are spotted on the apron. Or the goods having previously been collected and stacked on the transit shed floor are lifted by the cranes and placed on pallets, dead skids, trailers, or trucks, carried to the apron where the cranes or ship's gear lift them and land them in the holds.

Good Passenger Facilities

At the shore end of the pier, there is an imposing structure containing offices and passenger accommodations. At both sides are archways for railroad tracks to the apron. Next to these are the team arches on each side of the pier. The central portion in front of the transit shed is taken up by passenger entrances and offices.

This entrance resembles the modern railway passenger terminal rather than the conventional steamship pier. The passengers enter a large hall with stairways and elevators to the second floor. Here are located waiting rooms, ticket offices and other accommodations. From here the passengers are led on the pier proper through corridors which run down each side above the transit shed. There is also an open balcony the entire length of the pier as well as the enclosed corridor. Then, by taking them over the gantry gangways to the ship's deck, the passengers are at all times kept away from the cargo operations.

As the arrival or departure of passenger steamers at these island ports is considered quite an event, this balcony on a level with the deck of the ships, is the scene of many a gala celebration.

This pier was built with the express idea of filling the need for facilities adequate to accommodate the largest passenger steamers. It is not unusual to handle as many as 1200 passengers from such ships as those of the Matson, Dollar, Canadian Pacific, Cunard and White Star lines on their world cruises. Combining, as it does, excellent freight handling facilities with separate passenger accommodations, it gives Manila one of the finest ocean terminals in the world for handling ships of various types.

It has been asked why the largest port in the world, New York, does not have more such modern facilities. There are many and varied causes such as crowded condition of the waterfront, high real estate values, the fact that each steamship company has its own terminals to handle its particular ships, the necessity of having as much storage space on the pier as possible—by putting the transit shed walls to or nearly to the water's edge, leaving only sufficient apron on which to handle lines, and working cargo through doors placed at intervals along the entire length of the shed; the extensive lighterage operations eliminating the car-to-ship movement of freight, since the rail heads stop on the Jersey shore; the public loaders system which is observed on all piers with which the overhead shop cranes would interfere; and especially the fact that the steamship companies endeavor to obtain sufficient facilities with the least possible outlay on construction.

Most New York Piers Old

Another point to be considered is the age of most of the New York piers. With the exception of the few passenger terminals of recent construction, the piers are anywhere from 20 to 40 years old. Another thing, which is in line with the cost of water frontage is the fact that with the strong tidal conditions existing in New York, the slip between the piers has to be wide enough to allow for maneuvering the ship. Once berthed the vessel can and often is breasted off again with floats and then platforms are hung from the sides of the piers. These platforms serve as a landing place for the cargo and answer the purpose of the wharf apron found in other port construction. This maneuvering space and also the need for space for lighters alongside the ships controls the width of the slips and consequent narrowing of the pier proper, within the same waterfront footage.

The Staten Island piers which were constructed comparatively recently have wide aprons and also are fitted so that cranes, etc., could be installed very easily. All of their superstructure is strengthened with this in view.

Improving Longshore Labor by Decasualizing

DECASUALIZING the longshore labor of a port is practical; it has been done many times. Longshoremen and waterfront employers both benefit from decasualization; not at the expense of each other, but from the elimination of wastage, human and material. The only requirement is that both groups co-operate in a port plan of employment, sharing equally in control-of-the-job rather than each struggling for sole control.

The objective of the recovery act for longshore labor can only be reached by decasualization. The code provision seems admirably designed to encourage all parties at interest to take the necessary beginning steps toward that objective. The individual port is the natural, practical unit, since labor is necessarily local and stevedoring is concerned almost solely with labor.

The kernel of the problem is the "reserve" of labor needed in each port; though all the labor of the port concerned in handling cargo should be taken into the port plan. The crux of the difficulty is to maintain an adequate reserve yet avoid a surplus. The work of cargo-handling is inherently casual as carried on by a single employer, but can be compensated through a port plan. The principle of decasualization places the responsibility on the industry to provide a livelihood for the men it needs to do the work efficiently and with reasonable dispatch.

Limit the Number Eligible

The method of carrying out the principle is to limit the intake of men eligible to work a waterfront to the needs of the waterfront and then distribute the available work according to the needs of the men as well as the requirements of the ship.

The approach requires stevedores who are competitors in securing contracts to become co-operators in their labor problems which are common, not competitive. Under the recovery act labor may take a share in the program. Experience indicates employers should willingly give labor its full share in the program if the largest measure of progress is to be made and to endure. Both sides contribute in full measure but management has the greater responsibility for preventing abuses because it should have the larger understanding of the problem.

Longshoring is regarded by many as an attractive job. It pays well but requires skill, is hard and hazardous. The labor abuses are not inherent in the job and can be remedied.

The rewards of decasualization are:—

For the longshoremen:

- A self-respecting craft, with satisfactory condition of work;
- Steady and good earnings, though irregular hours;
- Leisure time, heretofore spent looking for the next job;
- More time on the job, less in the hospital;
- A voice on wages and working conditions;
- The opportunity to sit around the table and talk things over with the employers.

For the ship:

- Reasonable and sure turn-around, through a dependable supply of competent men;
- More economical cargo-handling;
- Proper stowage, the minimum of accidents, and little or no pilferage.

For the stevedore:

- Freedom from strikes (including striking-on-the-job);
- An adequate supply of dependable, competent men;
- A chance to do his management job rather than to spend his time recruiting and battling casual labor.

These rewards are to be had if the industry will but take them. The National Adjustment commission (war labor board for longshoring) attempted to decasualize the work and challenged the industry to do so for itself. Not much progress has been made, but the recovery act offers promise of accomplishing it. The experience in the port of Seattle proves it can be done.

Methods Vary in Detail

The method of decasualizing longshore labor will vary in detail with the several ports because of the varying conditions; but everywhere the essentials have been the same. These are: Central registration, and central dispatching.

Central registration is control of the selection of longshoremen eligible to work in the port vested in a central body, usually of equal numbers of longshoremen and employers. The purpose is to limit the number of men to the need. This involves agreement by the individual employer to give up, or at least curtail, his freedom to hire at will, and instead to draw upon this eligible group for his labor.

Central dispatching is the companion policy. It not only furnishes the facts by which is known the number needed but it provides the machinery of distributing available men according to ships' needs and of spreading available work to provide a living for the men. Orders for men are placed by the several ships and docks in a centrally located hall; the men go or telephone to the hall to be directed as to when and where to work. The telephone and automobile, though not indispensable, are valuable helps to decasualization. Mobility of the men and rapid communication help to overcome distance in a large port, and substantially reduce the number of men needed, thereby increasing earnings.

Hire Only Registered Men

Freedom of the employer to hire at will from within the registration is usual; just as under a union agreement, where he undertakes to hire only union men, but is free within such limit. There is limited intake, there is to that extent the beginning of decasualization, but further curtailment of freedom to hire is necessary if the reserve of men in the port are to be provided a living. Unless there is some plan for spreading the work, the usual result will be a minority of the men will get most of the work; the majority will get by though under-employed; and the fringe will have to eke out a precarious existence with the aid of charity.

This article is an abstract of a pamphlet on the *Decasualizing of Longshore Labor and the Seattle Experience*, by F. D. Foisie.

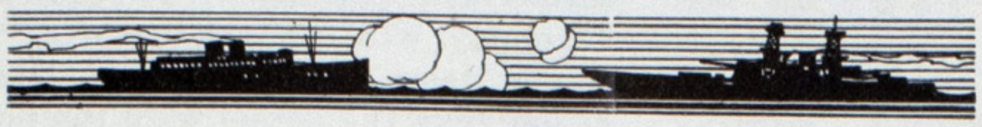
Italian Line Sailings

The REX of the Italian line arrived in New York on April 26 from Naples, Genoa, Villefrance and Gibraltar, with a total of 1529 passsengers in her four classes, which is said to be a record passenger list for any transatlantic liner this year up to that time. The REX with her sistership, the CONTE DI SAVOIA divided the honors for the largest passenger list and largest total of passengers carried in 1933.

On sailing from New York April 28, the REX had 1530 passengers in four classes which is a record eastbound passenger list for any transatlantic liner up to that time this year.

The ROMA of the Italian line sailed from pier 97, North river, New York on May 5 with a total of 503 passengers. The CONTE DI SAVOIA sailed from New York at noon on May 12 for Gibraltar, Naples, Nice and Genoa with 1100 passengers. The SATURNA arrived in New York on May 16 from Adriatic and Mediterranean ports. She had 551 passengers on board.

Useful Hints on Cargo Handling



IN GENERAL, we feel that the people who set standards for railroad equipment ought to be more directly concerned with performance than with design or construction or details of any sort; in other words, that railway equipment of almost any kind ought to be bought not as something like a ship model to be put on the mantel and look nice, or bought by the pound, but as a tool to do work. We are doing what we can to help stimulate the development of real performance specifications in a good many classes of railway equipment, supplies and materials, and I think we are getting somewhere with it." From an address by R. L. Lockwood, director, section of purchases, federal co-ordinator of transportation.

The above applies with equal if not greater force in shipping.

Facts Stop Arguments

Arguing about qustions of fact is a waste of time. Lengthy arguments frequently arise on questions of facts which can be determined accurately within a few minutes. For example, how many tons of canned goods were carried in the month of November. Why argue about that, if the boss says 5000 tons, and his assistant says 7000 tons, the facts are it is either one or the other or something else. It is an easy matter by referring to the records to determine *accurately* just how many tons of canned goods were carried.

Newsprint rolls coming from the Pacific north west are now shipped with a waxed paper wrapping inside of the outer wrapper. This assures them against any moisture penetrating into the paper and has been found to be very efficient in eliminating claims on a long water trip.

New Bull Line Ships

THE new Bull line freighters ANGELINA and MANUELA described in this issue (see page 10) have a small inexpensive fitting on the strongbacks which allows them to be locked in the slots when it is necessary to leave one or more sections of hatch on and work through the remaining opening.

It was also observed that though these are not the latest thing in a freight ship, their side ports are of the sliding type, eliminating the necessity of breasting the ship out from the pier as is the case in some of the latter installations where the doors swing out on hinges. It also eliminates the possible damage to hinges when berthing against the piers.

There are not any sounding pipe plugs or other obstruction in the center of the deck, all cleats, cargo and mooring, standing gear, and vents are set either in the upper decks or on the bulwarks. This leaves the deck absolutely clear for deck cargo.

THIS page is being devoted to short items on all matters having to do with the more efficient turn-around of ships. These items are intended to be of a helpful nature.

We will welcome for this page brief descriptions, illustrated if possible, of any better or safer way of performing any function in cargo handling. Also, any questions submitted will be answered by the editor.

"If economizing on managerial ability means getting on with a smaller percentage of it than before, it is well nigh suicidal in the long run." Clark, *Economics of Overhead Costs.*

Use of Net Slings

USE of net slings is almost entirely avoided on a real modern terminal. The old practice of dumping a sling load by unhooking one side of the net and hoisting away resulted in considerable damage to cargo. However, the net sling used in conjunction with a "pie plate" as described previously in this section is effective and does not cause damage. The "pie plate" is a large circular platform which is placed in the center of the net for the cargo to rest on and to keep the sling from bearing hard against the cargo and damaging it.

Due primarily to the necessity of having a package small enough for the Chinese, and other Eastern coolies, to handle by hand, the export shippers of tin plate have been prevented from making shipments of the larger packages to the Far East that has made such a large savings possible in the movement of this commodity to the Pacific coast and the Hawaiian Islands where they are now using power equipment and taking a one ton package at a time.

By attaching a tongue fitted with a suitable ring and connecting it to the automatic coupler of a power driven tractor the ordinary small hand lift truck can be made into quite an efficient piece of equipment for the handling of large skids of paper.

Your Batting Average

SUPPOSE you were to analyze the records of hundreds of baseball batters, if you found that they swing their bats in certain ways they *invariably* struck out, flied out, or fouled out, the chances are you would conclude that if others were to bat the same way against the same kind of pitching the same things would happen.

And if by the same token, you found out that if batters swing their bats *another* way, against the same pitching, they got hits—singles, doubles, three base hits, a home run—the chances are the way these men swing their bat could be used successfully by other men of similar ability.

The rule goes, no matter the size of the gate receipts. It goes for stores, and for departments in stores, as it goes for the analysis of the experience of any large group of people doing anything. You learn what *not* to do from the errors from the strike-outs. You learn what to do from the base hits and what to do well from the home runs and how they are made. The foregoing is quoted from *Amos Parrish Magazine*, March, 1933.)

Wood Shavings Used

WOOD shavings have been found to be considerably more effective than sawdust or sand on wet gangplanks and slippery decks. The small flat surfaces found on the shavings from a rotary planing mill take up the moisture better than the smaller cubical and square surfaces of the sawdust. They not alone take up the moisture but give more surface between the wheels of tractor or trailer than the round particles and are far better as an adhesive agent.

This has been found to be the case with rubber tires on iron surfaces as well as on wooden surfaces.

Tank Tests Show Improved Hull Performance

By R. D. Mac Millen

THAT shipowners throughout the world are overcoming to some extent their traditional conservatism and are taking advantage of improved hull forms to speed up their ships and to make them more seaworthy and economical to run, is evident in the operation of the American Maierform Co., New York, and the parent company in Germany, according to W. K. Maier, son of the inventor and head of the American company.

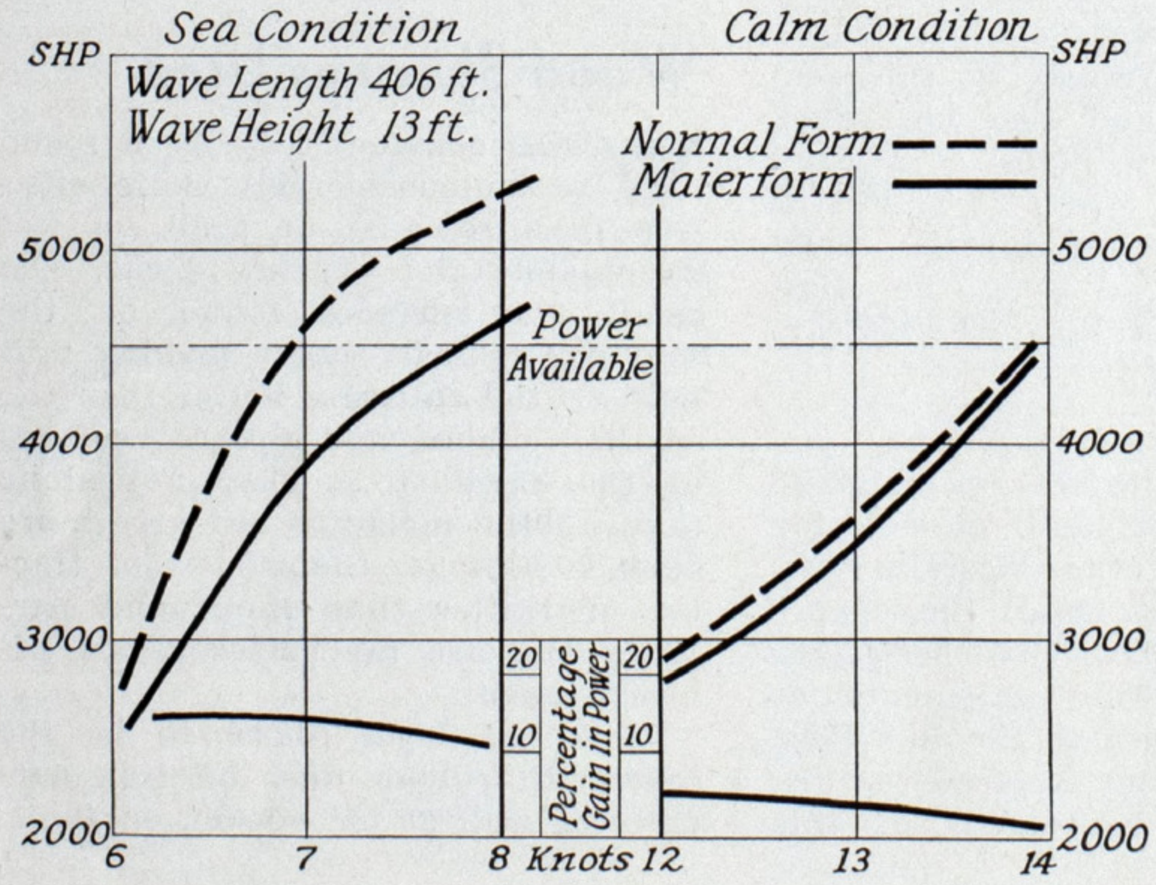
A total of 63 Maierform vessels, with an aggregate of 250,500 shaft horsepower, has been built or contracted for since the introduction of this type of hull form in 1926. Of this total, 108,000 shaft horsepower was placed in 1933 alone and 38,000 shaft horsepower has been contracted for up to the middle of May in 1934. By far the largest proportion of this aggregate tonnage is of Dutch, French, Scandinavian and British registry. It is expected, however, with the revival of shipbuilding in Germany, that a number of shipowners in that country, impressed by service records and model basin tests, will add Maierform tonnage to their fleets, utilizing this form in the forebody, at least, if not in the complete hull.

The North German Lloyd, one of the first companies to use this hull form, already has four large cargo carriers of this type in commission, and will use the design in its newest vessel, a 700-ton deadweight cargo liner of 14.25 knots average sea speed, for the West Indies service.

Moreover, the German merchant marine is about to have its first turbine electric ship, which will also be the largest Maierform vessel ever constructed and the eighth of this design to be ordered this year. The new vessel, with twin screws delivering more than 20,000 shaft horsepower and of 16,000 gross tons, will have an unusually high sea speed and is to operate between Bremen and the Far East. It is interesting to note that turbine electric propulsion in Europe was pioneered on the Far Eastern run, where the voyage is broken up into a number of legs of varying length, making this type of drive particularly suitable.

A series of experiments has recently been carried out in the Hamburg model basin to compare the action of normal and Maierform model hulls in artificial waves of a magnitude to simulate conditions encountered by vessels in service in various parts of the world. The accompanying graph officially attested, records a direct comparison of the results obtained for a model of normal hull form and a model of Maierform forebody combined with a "V" shaped normal aft body, run self-propelled against artificial waves corresponding to average Atlantic waves 406 feet long and 13 feet high.

It will be noted from the results recorded in the graph that in calm water condition, the Maierform compared with the normal form forebody shows only 5 per cent improvement. In rough water condition, however, the maximum Maierform superiority is slightly in excess of 15 per cent. This substantial saving may, of course, be translated into terms either of greater power, or speed, or fuel economy in rough water. Considering average sea speed for instance, the experiments show that, with a maximum of 4500 indicated horsepower, the vessel with the Maierform forebody will, on the basis of these model tests, lose one knot less sea speed than the vessel with the normal form of forebody.



Comparison of results from Hamburg tank tests in sea and calm conditions for a 7000-ton cargo ship, 410 ft. x 54 ft. 6 in. x 24 ft. using self-propelled normal hull form and Maierform models

New York Propeller Club

In observance of national maritime day the New York Propeller club held a banquet at the Downtown Athletic club on May 22. The principal speaker was Charles W. Taussig, president of the American Molasses Co., and one of President Roosevelt's advisors.

Other speakers included H. Gerrish Smith, president of the National Council of American Shipbuilders, Joseph B. Weaver, deputy administrator of the national recovery administration in charge of shipping, and Arthur M. Tode, national president of the Propeller club. C. H. C. Pearsall, president of the New York Propeller club and vice president of the Colombian Steamship lines, presided. Charles E. Murphy, former president of the Advertising club, acted as toastmaster. More than 300 members and guests attended.

Members of the dinner committee of which R. R. Piper of the United Dry Docks Inc. was chairman, included Commissioner John McKenzie of the New York city dock department; E. W. Fiske Jr., port captain of the Standard Oil Co.; Robert F. Hand, vice president of the Standard Shipping Co.; George J. Kaye of the United Dry Docks Inc.; J. J. Kelleher of the United Fruit Co.; M. J. Hanlon of the Black Diamond line; William H. Lee of the International Mercantile Marine Co.; H. Markwalter of the Colombian line; I. H. Paine, vice president of Cosmopolitan line, J. W. Hendry of the Bethlehem Shipbuilding Corp.; B. A. Moran, of the Atlantic Basin Iron Works; and Cuthbert Hague.

U. S. S. San Francisco Trials

The U. S. S. San Francisco, light armored, heavy cruiser of 10,000 tons displacement, built at the United States navy yard, Mare Island, Calif., was recently given her first speed and power tests and standardization trials over the measured mile course off Point Vincente, Calif.

Construction of the San Francisco, coming within the provisions of the London treaty of 1930, was authorized Oct. 11, 1930. The keel was laid Sept. 9, 1931 and she was launched on March 9, 1933. Her length overall is 588 feet; beam, 61 feet, 9 inches; and normal draft, 21 feet, 7 inches. She carries a main battery of nine 8-inch guns mounted in 3 turrets. Her maximum designed speed is 32.5 knots.

Up and Down the Great Lakes

Navigation Opens—Grain—Coal—Ore—Lake Levels—Propeller Club—Protective Association—Vessels in Service

NAVIGATION on the Great Lakes opened later this season than in former years. April 29 was the opening day for the United States locks at Sault Ste. Marie, Mich., as compared with April 19 last year. The first transit through the Canadian lock took place on May 1. The Welland ship canal opened on April 17 as compared with April 4 last year, and the St. Lawrence canals opened on April 18, four days later than in 1933. The freight passing through these canals during April this year was consequently considerably lighter than during April, 1933.

According to the Canadian bureau of statistics, only 16 vessels of 16,841 registered tons transited the Sault Ste. Marie canals during April as compared with 338 vessels of 679,129 registered tons in April, 1933. The total freight through these canals in April, 1934 amounted to 12,897 tons compared with 695,712 tons during April, 1933. No freight transited the Canadian locks at Sault Ste. Marie during April, 1934, while 120,475 tons of freight transited this canal in April 1933.

For April, 1934 the total freight through the Welland ship canal was 254,011 tons as compared with 587,854 tons in April, 1933. Only 54,019 tons of freight passed through the St. Lawrence canals during April, 1934, as compared with 352,098 tons of freight through these same canals during April, 1933.

Lake Grain Shipments

The board of grain commissioners for Canada has issued its customary statement showing vessels loaded with grain at Fort William and Port Arthur. For the period from the opening of navigation to May 7, 1934, (the first two vessels loaded on April, 30), wheat shipments were: 2,727,126 bushels to Canadian lower lake ports; 1,611,246 bushels to Montreal; 169,301 bushels to Quebec; 562,516 bushels to Buffalo; and 288,562 bushels to other United States ports; making a total of 5,358,753 bushels. Besides wheat, there was also a total of 1,186,205 bushels of oats, and 567,894 bushels of barley, going only to Canadian ports on the lower lakes, Montreal and Quebec.

Grain shipments increased rapidly in the period from May 8 to May 14 with wheat shipments of 2,805,675 bushels to Canadian lower lake ports; 1,259,147 bushels to Montreal; 217,643 bushels to Sorel, Que.; and 3,388,401 bushels to Buffalo; making a total for that period of 7,670,868 bushels (fractions of bushels have been omitted). The total shipment of oats in this same period amounted to 1,493,420 bushels; of barley 846,475 bushels; and flaxseed, 28,531 bushels, going only to Canadian lower lake ports and Montreal.

Lieut. L. L. Waite, U.S.N. will relieve Lieut. John G. Cross, U.S.N. as officer in charge of the branch hydrographic office at Cleveland. Lieutenant Cross, who has been ordered to duty on the Asiatic station, has been in charge of this office for two years.

April Lake Levels

The United States Lake survey reports the following monthly mean stages of the Great Lakes for the month of April, 1934, determined from daily readings of staff gages.

Lakes	Feet above mean sea level
Superior	602.17
Michigan-Huron	577.64
St. Clair	573.23
Erie	570.12
Ontario	244.27

Lake Superior was 0.06 foot higher than in March and it was 0.26 foot above the April stage of a year ago.

Lakes Michigan-Huron were 0.22 foot higher than in March and they were 0.32 foot below the April stage of a year ago.

Lake Erie was 0.52 foot higher than in March and was 1.55 feet below the April stage of a year ago.

Lake Ontario was 0.59 foot higher than in March and it was 0.58 foot below the April stage of a year ago, 1.65 feet below the average stage of April of the last ten years.

Propeller Club Meetings

The Propeller club of the port of Cleveland celebrated national maritime day, May 22, by holding a dinner at the Hotel Carter. Over 100 members and guests attended. A. T. Wood, president of the club, presided. Capt. R. W. England acted as toastmaster. Robert G. McCreary gave an interesting account of the historic voyage of the SAVANNAH.

The principal speaker was Ira A. Campbell, well known New York admiralty lawyer and counsel of the American Steamship Owners' association. Mr. Campbell has taken a leading part in drafting the proposed general shipping code and because of his intimate connection with American maritime affairs, his analysis of the present condition and future prospects of the American merchant marine was received with the greatest interest.

In his address he made it clear that necessary replacements of American ships in foreign trade cannot be made except through government aid to offset differentials in the cost of building and operation. In coastwise shipping he emphasized the fact that unless some way is found to bring rates again to a profitable level the prospects of adequate replacements are anything but bright. He stated that he preferred to see the industry make an attempt at self regulation under a code with adequate governmental supervision and control instead of absolute governmental regulation, and without some form of regulation there can be no prosperity and without prosperity there can be no private building of ships.

The Propeller club of the port of Toledo held a dinner meeting at Toledo on May 16. The principal address was delivered by Rev. R. Lincoln Long, who spoke of his experiences during a world voyage, and referred to the importance of an American merchant marine as a valuable national asset.

Coal Shipments Underway

Bituminous coal shipments from Lake Erie ports from Jan. 1, 1934 to May 1 amounted to 1,739,583 net tons of cargo and 40,205 tons bunkers, or a total of 1,779,788 tons, as compared with a total, cargo and bunkers, of 1,545,159 tons for the same period in 1933, and a total of 1,323,338 tons in the same period of 1932.

The shipment of bituminous coal as cargo this year from Jan. 1 to 7 a.m., May 14, amounted to 3,254,271 net tons, and 84,873 net tons of bunker coal, or a total of 3,339,144 net tons, during that period. This compares with a total of cargo coal and bunkers for the same period in 1933 of 2,785,976 tons.

The Protective Association Holds Annual Meeting

The annual meeting of the Great Lakes Protective association was held at Cleveland, May 3, with J. S. Ashley, chairman, presiding. Something over 80 per cent of the membership in the association was represented directly or by proxy. B. F. Tewksbury and W. W. Newcomet were elected members of the advisory committee succeeding C. L. Hutchinson, F. I. Kennedy and R. J. Paisley resigned. The printed annual report of the Great Lakes Protective association had already been sent out to members.

The annual report states that while there was one less loss in 1933 than in the previous year, losses were, on the average considerably more costly and some of the heaviest were preventable and never should have occurred. On the present computation, the report states, contributions exceed losses by $23,695.96.

Founded Twenty-five Years Ago

At a later date the advisory committee will elect the officers of the Great Lakes Protective association. The fiscal year 1933 is the twenty-fifth year since the inception of the Great Lakes Protective association and the fifth year in which 50 per cent of the valuation of vessels in its membership has been reserved from conventional insurance. There were 113 vessels included in the membership of the Protective association during 1933.

At a meeting of the advisory committee on May 8, the following officers were re-elected for one year: J. S. Ashley, chairman; George A. Marr, secretary and attorney-in-fact; A. E. R. Schneider, treasurer; J. A. Armstrong, assistant treasurer; and Robert G. McCreary, counsel.

Strike Quickly Settled

The prompt settlement of the strike of tugboatmen, employed by the Great Lakes Towing Co., removed the possibility of serious delays to shipping on the Great Lakes which is now well under way. It was one of the shortest strikes on record. The men walked out at Buffalo on the evening of May 16, followed the next evening by tugboatmen at Cleveland and three other ports. The two unions involved were the Licensed Tugmen's Protective association and the Tug Firemen and Linesmen Protective association.

The strike was amicably adjusted late on the evening of May 18 when the men accepted a proposal by G. A. Tomlinson, president of the Great Lakes Towing Co.

The men were striking for an eight-hour day and the wages received in 1929. Mr. Tomlinson proposed that the questions in dispute should be settled by arbitration and that both sides should agree to an impartial arbitrator to be selected by the national labor board who should determine the wages and hours of service. Pending the findings by the arbitrator, the men were to return to work. These terms were accepted by the men who at once returned to their work.

Had it become complete, the strike would have affected approximately 60 tugs and 500 men, and certain shipping operations requiring the use of tugs, would have been seriously handicapped. Credit for the sensible solution of this difficulty is due to G. A. Tomlinson, president of the towing company and Joseph J. Noonan, representing the licensed men and Owen J. Cavanaugh, representing the firemen.

Announcement has been received of the organization of the firm of Duncan-Leckie-McCreary-Schlitz & Hinslea, successor to Goulder White Garry & McCreary Holding Duncan & Leckie, as a partnership for the practice of general and admiralty law, with offices in the Union Trust building, Cleveland.

Ore Movement Begins

No ore was shipped from upper lake ports during April, 1934, while in April, 1933, 83,210 tons of ore were shipped out of the port of Superior. Of that amount only 8599 tons were received at Lake Erie ports during April last year. It is expected, however, that the figures for ore shipments in the month of May this year will show a substantial increase over May last year.

The first cargo of ore from upper lake ports (Escanaba) arrived at Toledo on May 4 in the Presque Isle of the Cleveland Cliffs Co., so that the season may be said to have gotten under way during the first week of May.

The shipments of ore by rail from Lake Erie ports to furnaces during the month of April amounted to 416,225 tons compared with 104,395 tons during April, 1933. The balance of ore on Lake Erie docks on May 1 this year amounted to 4,570,626 tons as compared with 4,969,363 tons on May 1, 1933.

Thomas George Fry died at Cleveland, May 5, after a long illness. He was born in Bristol, England, 1883. He served in the British merchant marine as an engineer and later became a surveyor for Lloyd's Register of Shipping. For a time he was stationed in Cleveland. He is survived by his widow and son.

Bulk Vessels in Service on The Great Lakes

In the American merchant fleet on the Great Lakes, there are 328 bulk vessels with a total carrying capacity of 2,748,800 long tons on a draft of 19 feet. Of this fleet, 188 vessels were in commission as of May 15, representing 57.32 per cent in number and 60.67 per cent in total cargo capacity, or 1,667,800 long tons on a draft of 19 feet.

In this connection it is to be noted that the permissible draft at the opening of navigation this year is very near the lowest on record, being only 17 feet 6 inches. The full load capacity on this draft is, therefore, considerably less than the capacity mentioned above. Of the 188 vessels in commission, as of May 15, no less than 139 were engaged in the ore carrying trade.

Comparison With Last Year

These figures compare very favorably with the number of bulk vessels in commission last year as of May 10 At that time out of 332 bulk vessels in the American fleet with a total capacity, on 19-foot draft, of 2,780,500 long tons, only 93, with a total capacity of 775,200 long tons on a draft of 19 feet, were in commission; which corresponds to 28.01 per cent in number and 27.8 per cent in capacity. Of the 93 vessels that were in commission as of May 10 last year, 20 were engaged in the ore trade.

The number of vessels in commission shortly after the opening of navigation this year compares favorably with the peak of operation last year, on Sept. 15, when 217 vessels of 1,891,100 long tons capacity were in commission representing 68.44 per cent in number and 65.76 per cent in capacity. Of the 217 vessels then in commission, 199 were engaged in the ore trade. The figures given above have been compiled by A. B. Kern, of the M. A. Hanna Co., Cleveland.

Illinois Waterway Traffic

Total shipments on the Illinois waterway from the middle of last June up to Jan. 1, 1934, amounted to 1,111,285 tons. Tonnage for the entire Illinois river for 1933 was 293,472, compared with 189,176 during 1932.

The lakes-to-the-gulf waterway was opened to navigation from Chicago to New Orleans, March 23. Traffic still will be hampered until about August by a bridge at Morris, Ill., which now is being replaced. This will interfere with traffic between Joliet and Ottawa and the heavy tonnage expected to be carried on the waterway will not be realized until that time.

Personal Sketches of Marine Men

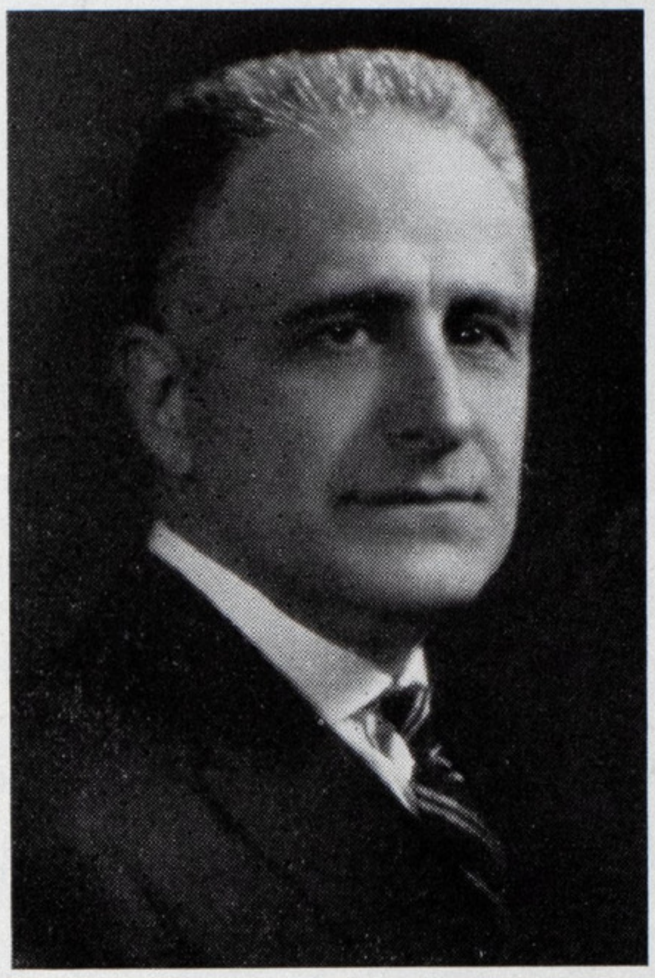
Joseph J. Glatzmayer, Vice President, Harbor Carriers, New York

By Ben K. Price

EXECUTIVE vice president of the Harbor Carriers of the Port of New York, organized to promote fair competition and the trade of its members.

FOR 37 years he was associated with one of the leading companies in the United States engaged in wrecking and marine salvage operations.

HE IS particularly well versed in maritime insurance, law and arbitration, having had more than 25 years experience along these lines.



LONG prominently identified with the maritime affairs of New York, Joseph J. Glatzmayer brings to his duties of executive vice president and secretary of the Harbor Carriers of the Port of New York, organized early this year, a broad experience and intelligent understanding. Affiliated with one large company and its successors for 37 years, advancing from stenographer to vice president, and active in numerous marine organizations, he has a broad conception of the multifarious problems which naturally attend the business of water transportation in the largest port in the world that is invaluable in his present work.

Particularly, is he well versed in all phases of maritime insurance, maritime law and arbitration, having been in charge of the insurance division of Merritt-Chapman & Scott Corp., and its predecessors for more than 25 years, handling all attending claims, adjustments and litigations.

Born in Brooklyn, Mr. Glatzmayer received his preliminary education in St. Boniface school, Brooklyn, and later attended LaSalle academy in New York. He became first affiliated with the marine industry in 1896, entering the employ of Chapman Derrick & Wrecking Co., New York, as stenographer. This company successively became Merritt & Chapman Derrick & Wrecking Co., and the Merritt-Chapman & Scott Corp., with Mr. Glatzmayer continuing on and advancing finally to the office of vice president of the latter corporation, a position he held until May, 1933, at which time there was a change in the management.

While now devoting his attention largely to conducting the affairs of the new Harbor Carriers organization, he was formerly president of the Foreign Commerce club of New York, the national board of steam navigation, and the New York Boat Owners association, and a former director of the Maritime association of the port of New York, as well as the New York Board of Trade Inc. Mr. Glatzmayer also was a former member of the American Arbitration association, and during the World war he was a member of the New York harbor wage adjustment board.

Mr. Glatzmayer's new duties are numerous, for while the Harbor Carriers association was formed on Jan. 30, this year, primarily for the purpose of preparing a code of fair competition under the national recovery act, it has for its additional objectives the fostering of the trade, commerce and interest of the owners and operators of vessels engaged in general lighterage, cement transportation, coal carrying and deck scow industries of the port of New York and (other than the New York Barge canal) its adjacent and tributary waters, including Long Island sound and its tributaries.

These and other matters, not the least important of which are legislative questions and the settling of differences between members and others by arbitration or by other methods, make heavy demands upon Mr. Glatzmayer, as executive vice president of the organization. Incidentally, the association is already taking an active interest in legislation, both federal and state, and recently vigorously opposed the proposed application for an increase of classifications 5 and 12 of the New York wharfage rates.

In collaboration with Robert D. MacMillen, now eastern manager of MARINE REVIEW, he published the brochure entitled *Black Horse of the Sea*, a historical review of the business conducted by Meritt-Chapman & Scott Corp., which received unusually favorable comment at the time of its issuance.

He is a member of the Whitehall club and president of the New York Fishing club, which latter affiliation indicates most conclusively his choice of sports.

Prof. C. H. Peabody Dies, Long at M. I. T.

C. H. Peabody died at the Peter Bent Brigham hospital in Boston on May 5, at the age of 79. Since the establishment of the department of naval architecture and marine engineering at the Massachusetts Institute of Technology in 1893 until his retirement and election as professor emeritus in May 1920, he had served as professor of naval architecture and head of the department.

All told, Professor Peabody had been actively connected with the Massachusetts Institute of Technology for 37 years, as he was appointed assistant professor of steam engineering in 1883. His first national recognition came as an authority on thermodynamics and published several books on this subject. Later he became equally well known as an authority on the science of naval architecture, and in 1904 issued his well known book on naval architecture.

He was a graduate of the Massachusetts Institute of Technology and in 1878 was appointed professor of mathematics at the Imperial Agricultural college in Japan. In 1881 he became assistant professor of mechanical engineering at the University of Illinois, and in 1883 he began his long connection with the Massachusetts Institute of Technology.

Professor Peabody was born in Burlington, Vt., Aug. 9, 1855. For his work in Japan he was given the decoration, Imperial Order of the Rising Sun, third class. He was a fellow of the American Academy of Arts and Sciences, and was a member of the council of the Society of Naval Architects and Marine Engineers.

He was retired on a Carnegie foundation pension and was succeeded as head of the department of naval architecture and marine engineering at the Massachusetts Institute of Technology by Prof. J. R. Jack.

All those who came in contact with him will remember, not only his high professional attainments, but also his great integrity, his sense of justice and his fairness.

Wayne T. Dimm Dies

W. T. Dimm, production manager of the Newport News Shipbuilding & Dry Dock Co., died at his home Newport News, Va., on March 27. He was born in Juniata county, Pa., Oct. 28, 1876 and was educated at Mifflin academy and Pennsylvania State college from which he graduated in 1900 with the degree of bachelor of science in mechanical engineering. He joined the staff of the Newport News Shipbuilding & Dry Dock Co. on July 11, 1900, and continued with that company until his death. He is survived by his widow and two sons.

H. L. Ferguson, president and general manager of the Newport News Shipbuilding & Dry Dock Co., paid him the following tribute, published in the April-May issue of the *Shipyard Bulletin*:

"The company has suffered a severe loss in the death of W. T. Dimm. He was one of the most faithful and efficient men to work for this or any other industrial organization. Our well being depended to an enormous extent on his sound judgment of both present and future values in preparing the chief estimates of cost of work. He had as sound and reasoned judgment as any man I have ever known, and his judgment was probably helped, rather than hindered, by the impediment in his speech which gave him an opportunity of thinking well before speaking. In paying tribute to him as a splendid and highly trained engineer, as an estimator second to none, as a successful production manager, as a cheerful companion and as an all-around man I feel that I am speaking the sentiments of all who were privileged to know him."

Allen R. Hunt Dies

Allen R. Hunt, 52, vice president and general manager of Todd Dry Dock, Inc., Seattle, died at his home in Seattle May 4. Mr. Hunt was recognized as a marine engineer and shiprepair expert of exceptional ability. During his long active career he made many friends in shipping circles in all parts of the country.

At the age of 9 his family settled at Port Townsend, Wash. He went to sea at 16 and at a comparatively early age attained the position of chief engineer of the famous daylight passenger steamer FLYER which made history on the Seattle-Tacoma route on Puget sound.

Prior to the war he joined the Seattle Construction & Dry Dock Co. as general superintendent. In 1916 he was appointed chief inspector of machinery for the United States Emergency Fleet Corp. and later was promoted to the position of chief inspector of new construction and repairs for Washington and Oregon.

In 1919 he became a member of the Todd organization as general manager. Ten years ago the title of vice president was added. He is survived by his widow and one son.

Jakobsen & Peterson, Inc., Brooklyn, have been awarded a contract by the United States public health service at Marcus Hook, Pa., for the construction of six 40-foot wooden quarantine cutters, to be powered with Fairbanks-Morse engines. The builder will receive $10,480 per vessel, under his low bid of Feb. 7, and delivery will be completed within 7 months.

Coast Guard Ship Rescues Norwegian Freighter

Driven ashore on Peacock spit at the mouth of the Columbia river May 4 the Norwegian motorship CHILDAR was saved from total destruction by a thrilling salvage job that will go down in the history of Pacific coast shipping. Bound for South Africa, with a full cargo, including a deckload of lumber, the CHILDAR, caught between the strong ebb current of the river and a terrific sea and gale from the southwest was swept on the spit. In the crash the boats were smashed, the deck cargo broke loose and four members of the crew were drowned or crushed to death.

The force of the elements drove the ship across the bar and in the face of terrific weather the coast guard cutter RED WING succeeded in taking the helpless hulk in tow. The bar was so rough that it was impossible to turn back and the cutter proceeded to tow to Cape Flattery, 150 miles north. This was done in seas of unusual violence. In the meantime the CHILDAR'S holds were nearly filled, due to a large puncture of the hull.

The RED WING was aided by the cutter CHELAN and private tugs and after a severe tow the motorship was finally brought into Esquimalt, B. C. Conditions were so threatening, as the vessel seemed about to sink at any moment, that all but three of the crew were taken off. The CHILDAR'S upperworks were carried away and the damage is estimated at $100,000. High praise is given the coast guard officers for their heroic efforts in the face of great danger.

Shipyard Strike Ended

By unanimous vote on May 12, the 3300 employes of the New York Shipbuilding Co., Camden, N. J., terminated the strike which has been in effect since March 27, and immediately returned to work.

The striking employes had modified their original demand and had indicated their willingness to accept an increase of 15 per cent in wages. In the meantime, Clinton L. Bardo, president of the shipbuilding company, on May 11, increased his previous proposal by 1.66 per cent making a total of 14.6 per cent advance in pay, and this was accepted.

Under the new ruling of the shipbuilding code, the hours per week on government work has now been advanced from 32 to 36 which will have the effect of considerably increasing the weekly wages of the employes, and will also increase the rate of production so as to make it possible to meet schedules of completion for the great volume of work in hand at this yard.

Maritime Day Observed

(*Continued from Page* 13)

tribute to another historic American vessel, the JOHN RANDOLPH, first iron ship to be launched in the United States. The RANDOLPH is also a product of Georgia enterprise. She was fabricated in England, in 1834, and the parts brought to this country on a sailing vessel.

The 1934 maritime day program began with ceremonies over the grave of Stevens Rogers, navigator of the SAVANNAH, at New London, Conn. Moses Rogers, commander of the SAVANNAH, also came from New London, as did most of the crew. Moses Rogers lies in an unknown grave in or near Georgetown, S. C. Speakers at the ceremony in New London included the governor of Connecticut, Wilbur F. Cross, R. J. Baker, president of the Steamship Owners' association, H. Gerrish Smith, president of the National Council of American Shipbuilders, and others. A. E. MacKinnon, secretary of the Maritime day committee of the Maritime league, acted as chairman. Officers and men of the Coast Guard academy under Capt. Randolph Ridgely Jr., commandant, also participated in the ceremony.

The second event, in the observance of the day, was an elaborate meeting at Savanah, Ga., on May 21, in charge of Mayor Thomas Gamble and Raymond D. Sullivan. The principal address at this ceremony was delivered by Secretary of Commerce Daniel C. Roper. A number of southern congressmen, state officials, and officers of steamship companies were in attendance.

On May 22 meetings were held in more than 50 cities. Among these were celebrations scheduled in New York, Philadelphia, Boston, Springfield, Mass., Norfolk, Va., Washington, Baltimore, Brunswick, Ga., Pensacola, Fla., New Orleans, Galveston, Pittsburgh, Cleveland, Kansas City, St. Louis, Los Angeles, San Francisco, Long Beach, and Seattle.

The New York meeting was held at Corlear's Hook park where the SAVANNAH was constructed. The mother of the President, Mrs. James Roosevelt, planted a tree as a memorial to the SAVANNAH and her crew. The tree was sent from Georgia by order of Governor Eugene Talmadge, who aided in the inception of maritime day and has taken a leading part in its observance. Other events at Corlear's Hook included short addresses by city and state officials, band music, and a program of chantey singing by a quartet from the Seamen's Church institute. Several thousand school children attended the ceremony.

Propeller club meetings in observance of the day were held in a total of 32 cities.

The New York observance will be given a continuing effect by the opening on that day of a marine exposition in Grand Central station. The exhibit will include large scale models of famous American vessels, maps, and a representative assortment of marine products and nautical instruments.

From all the foregoing it is evident that the United States is beginning to experience a re-awakening of interest in maritime affairs and that the glorious heritage of the days of the clipper ship has not been irrevocably lost.

William Gardner Dies

William Gardner, one of America's outstanding designers of yachts, died May 7 at his home Bay Head, N. J., at the age of 74. He retired ten years ago after a notable career as naval architect. His chief fame came as a result of his success in yacht design to which for the first time he applied scientific principles of naval architecture. Prior to his advent in this field, yacht design was largely based on model making. The designer depended almost entirely upon his skill of eye and hand in fashioning a model of good proportions.

Perhaps the most famous of Mr. Gardner's designs was the schooner ATLANTIC, built in 1905 and then owned by Wilson Marshall and commanded by Capt. Charley Barr. Against a fleet of internationally noted square-rigged yachts and schooners, the ATLANTIC won the German Emperor's cup and also set a record crossing of the Atlantic under sail of 11 days, 16 hours, and 22 minutes, a record, incidentally, which still stands.

The sloop VANITIE, designed by Gardner as a defender in the America Cup races of 1920, though failing of selection for this honor, the choice being the RESOLUTE, was by many considered a faster vessel, and since the race has often beaten the latter.

Mr. Gardner was born in Oswego, N. Y., in 1860. Before he was 15 years old he made a voyage around Cape Horn from New York to San Francisco. He entered Cornell university on his return from his voyage, and after graduating obtained some practical experience in shipbuilding. He then studied naval architecture at the Royal Naval college, Greenwich, England, and also worked in British and Scotch shipyards before returning to the United States.

He was an honorary member of the Society of Naval Architects and Marine Engineers and had been a member of the New York, the Manhasset Bay and the Corinthian Yacht clubs. He is survived by his widow and three sons.

Lake passenger service between Duluth and Chicago is to be established this summer for the first time since 1919. The ALABAMA is in this service.

Diesel Direct Drive

(*Continued from Page* 21)

This investigation into marine power plant equipment with the turbo-electric equipment already in the boat showed to a remarkable degree the development in recent years of diesel and steam machinery. The development of diesel machinery was not only along the line of better fuel economy but to a high degree towards simplification of design and construction. and greatly reduced first cost; while the demand for higher economies in steam brought about greater complications, increase of equipment and resulting higher first cost.

Another important advantage of the diesel direct drive offered is increased passenger accommodation. With this method of drive, one boiler and one motor room become available for passenger accommodations, and the other motor room for crew's quarters.

Port of New York Report

The board of engineers for rivers and harbors announces the publication of a revised edition of port series report No. 20 on *The Port of New York*. This report is one of a series covering the principal ports of the United States, prepared and published, as contemplated by law, by the board in co-operation with the United States shipping board, now a bureau of the United States department of commerce. The reports in this series are intended for the information and use of federal, state, municipal and port agencies, and others interested in the development of harbors and the establishment of port and terminal facilities. They also contain information useful to shipping and transportation interests in connection with the movement of goods through the various ports.

The report of New York is published in three parts, part 1 containing the general report, part 2 the detailed description of piers wharves and docks, Part 3 the maps.

New Seawall for Seattle

Permanent improvement of Seattle's waterfront by the construction of a seawall, filling, paving and relocation of railroad tracks is under way. After eight calls for bids had failed to bring satisfactory proposal from private contractors the city undertook the job by day labor. The work is expected to be completed in the spring of 1936. Funds available total $1,396,000 of which the state donated $496,000, $600,000 is provided by a bond issue and $400,000 is assessed against abutting property. The improvement covers a distance of 6800 feet.

Marine Review

Reg. U. S. Pat. Off.

The National Publication Covering the Business of Transportation by Water

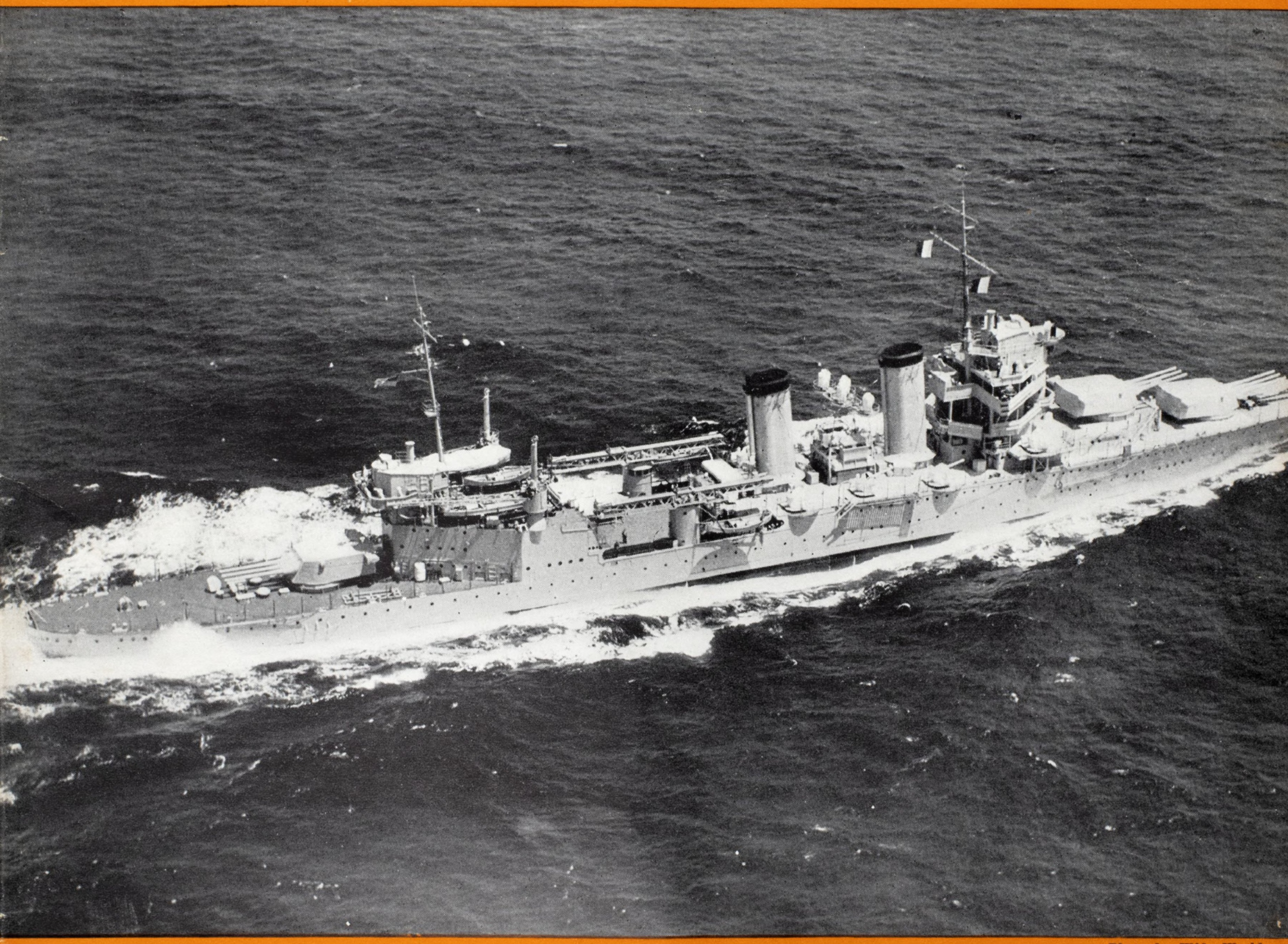
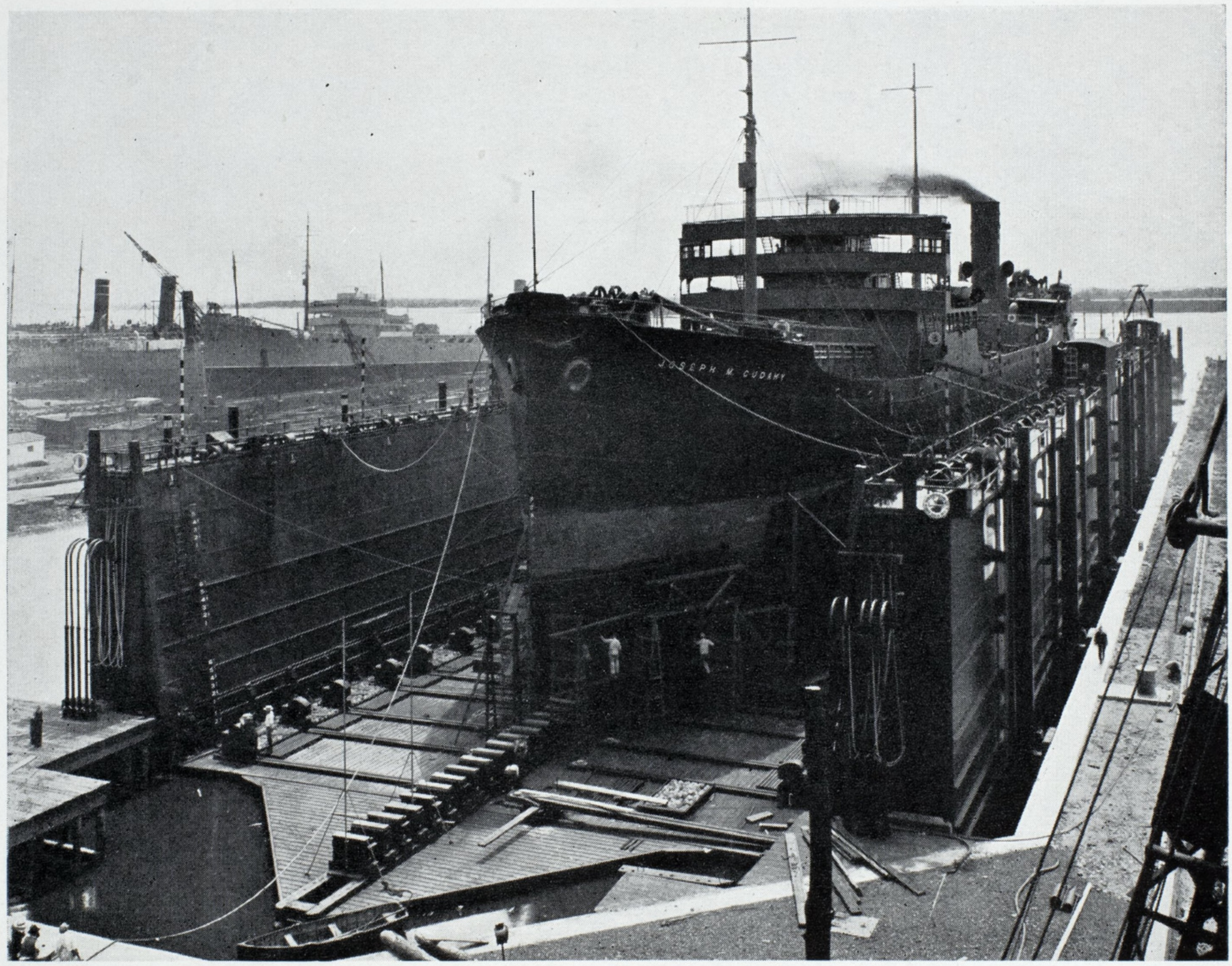


Photo by Wide World

Cruiser, U. S. S. San Francisco

June, 1934

MARINE REPAIRS » » »



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20 Contrarudders ordered by American-Hawaiian Line

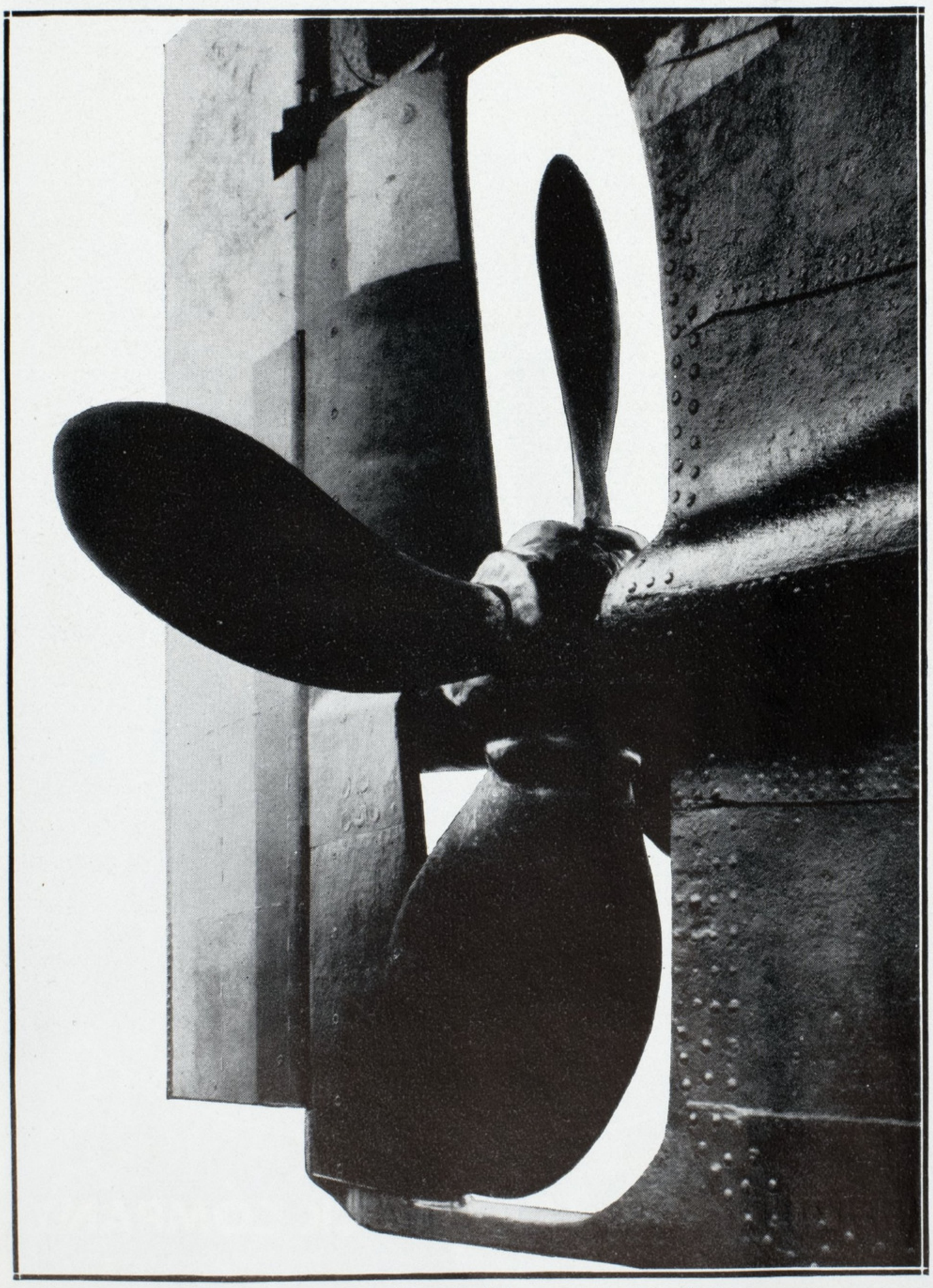
The Contrarudder is a combination of contrapropeller and streamline rudder. Hundreds of installations have proved that it

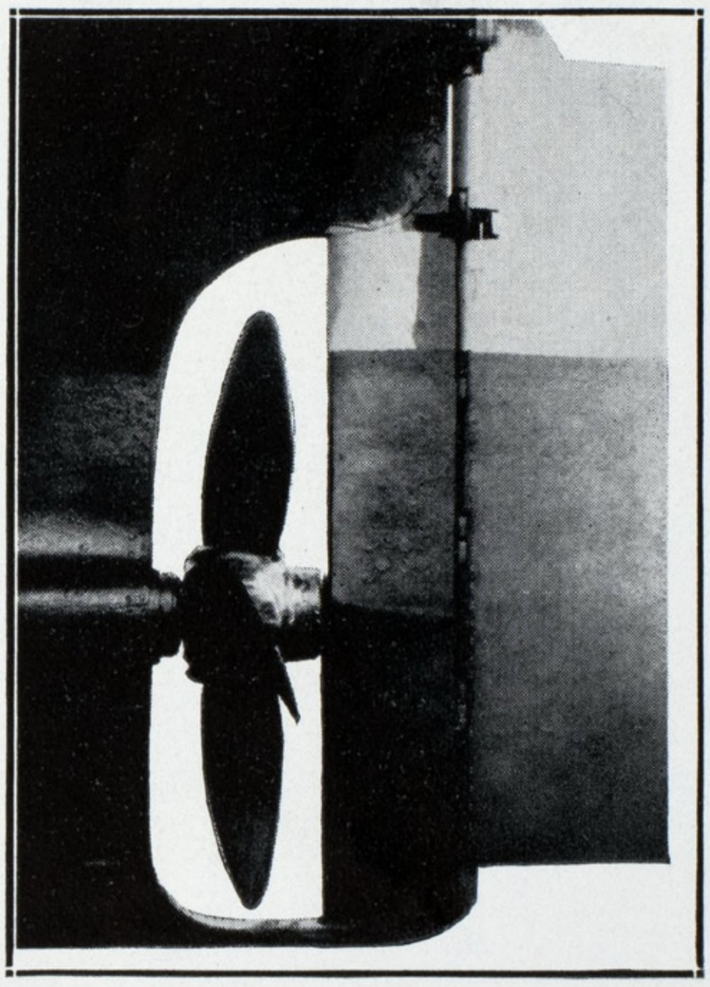
Increases Speed
Reduces Fuel Consumption
Improves Steering
Diminishes Vibration

Order Follows Extended Trial Demonstrating Fuel Savings—Greater Speeds

The American-Hawaiian Steamship Company for several years has been testing Contrapropellers and Contrarudders on three classes of vessels. The results in fuel savings and increased speeds have been so satisfactory that the company recently placed an order for equipping twenty more ships. In normal operation Contrarudder installations pay for themselves in one year.

Bethlehem Shipbuilding Corporation, Ltd., is sole manufacturer of the Contrapropeller under license from Th. Goldschmidt Corporation, 70 Pine Street, New York. Full information as





to the possibilities of improving the performance of your ships with this equipment can be obtained from any Bethlehem Sales Office or Plant, or from the Goldschmidt Corporation.

Here are two views of a typical Contrarudder installation.

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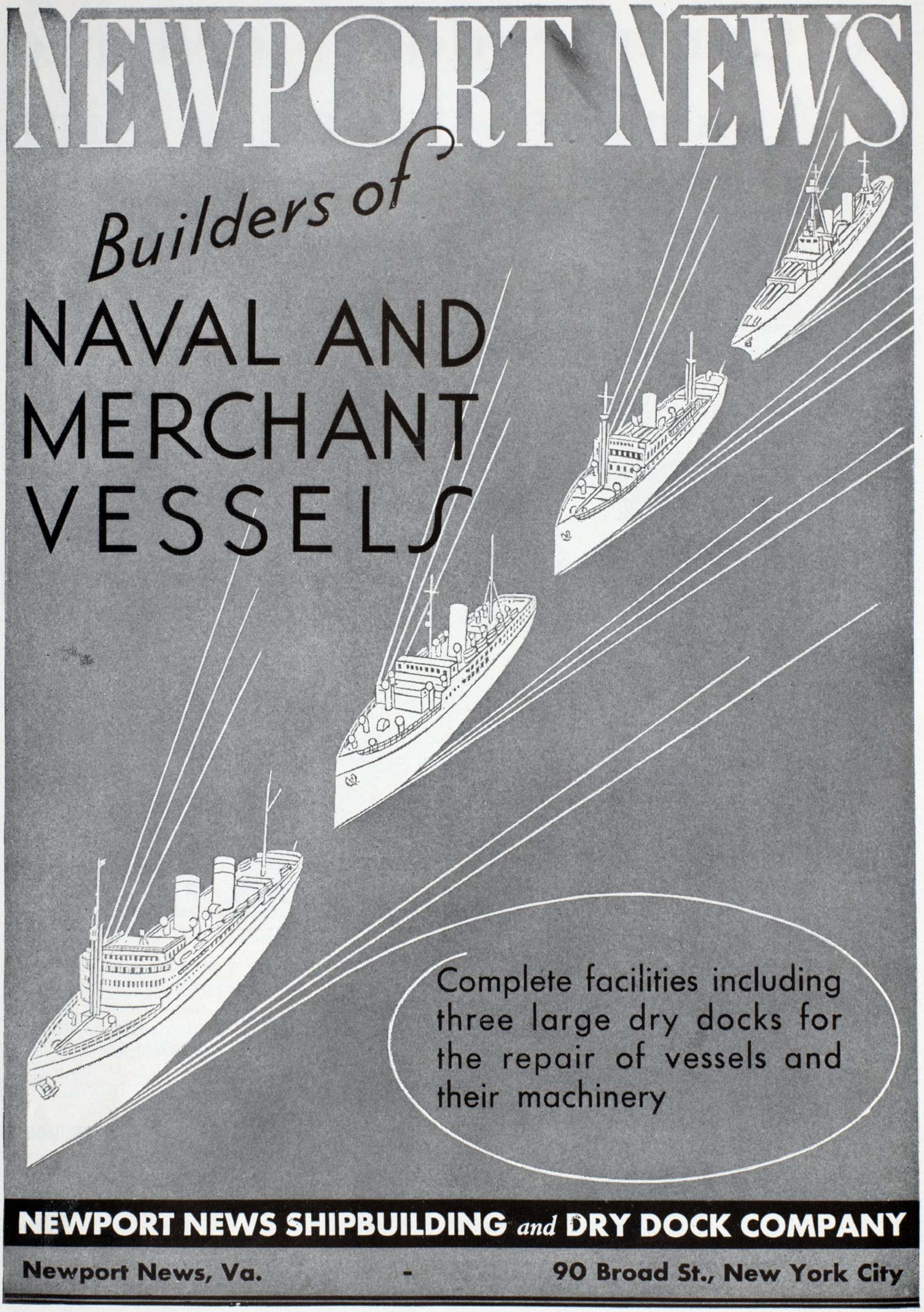

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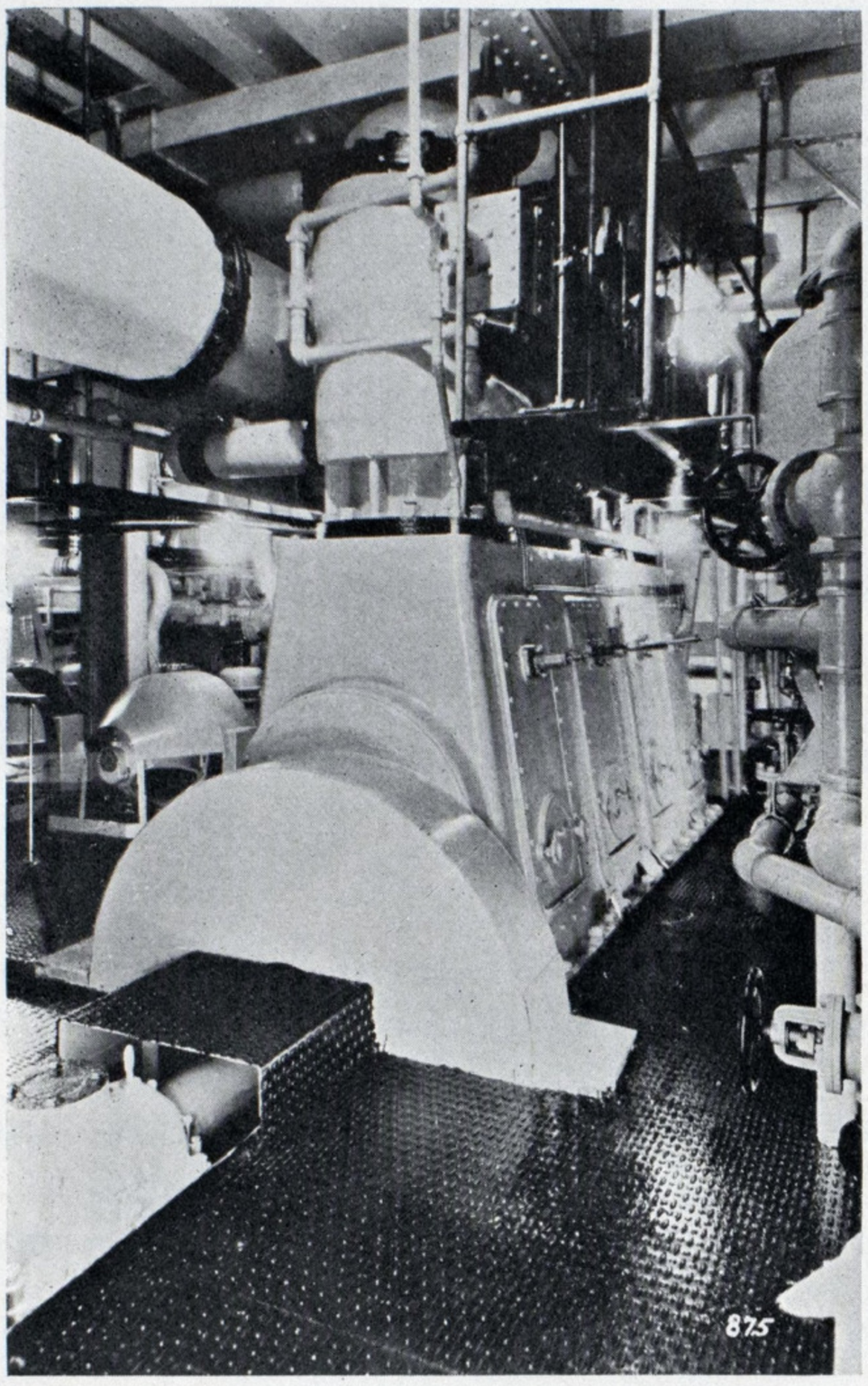
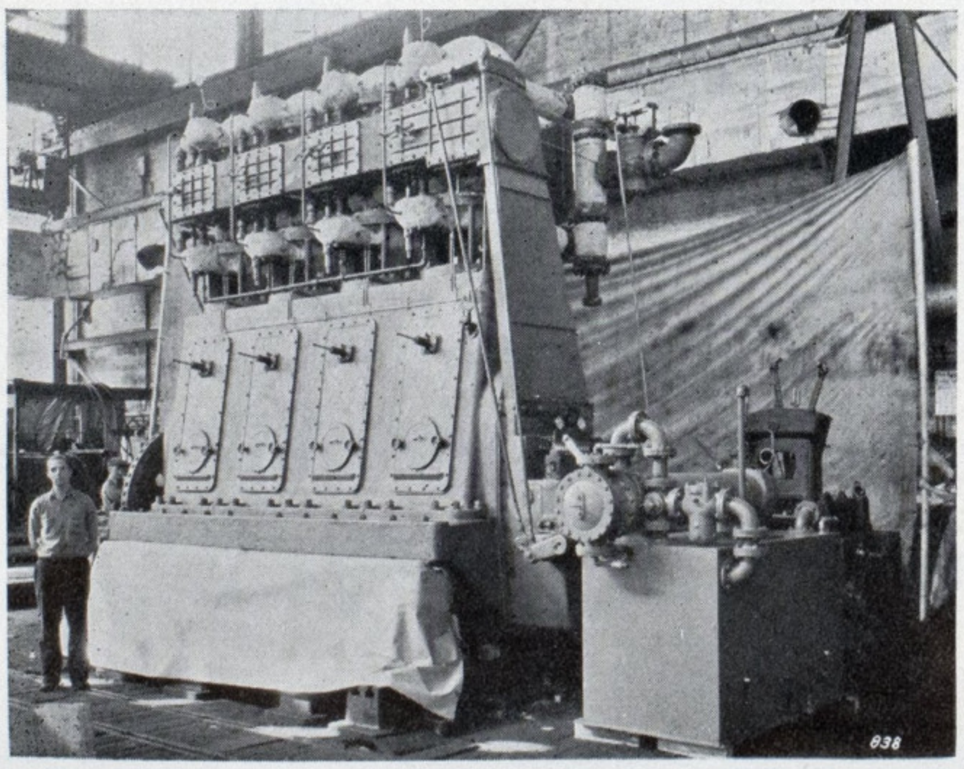


Starboard engine on Pennsylvania Railroad Company's new S.S. "Del-Mar-Va".



Marine Unaflow with oil cooler and tank

It would be the height of business folly to spend the time and money to develop an entirely new type of expensive mechanical apparatus and then place it on the market if the builders were not positive they could prove its superiority over competitive equipment for the conditions under which it is offered.

The Skinner Marine Unaflow Steam Engine has justified its builders' confidence in the installations now in marine service. These engines were purchased only after careful investigations and comparisons were made with other methods of propulsion.

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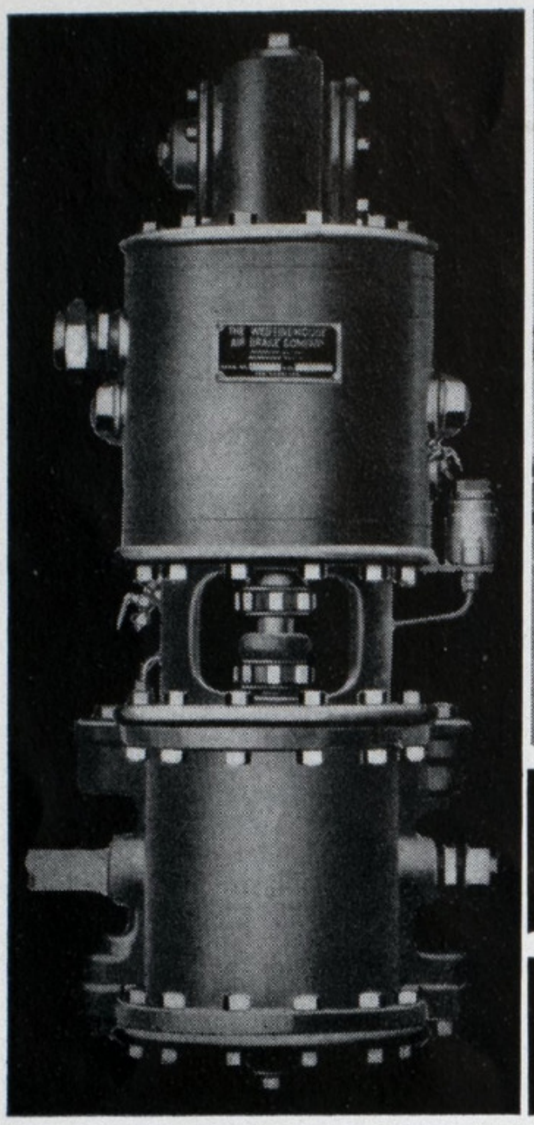

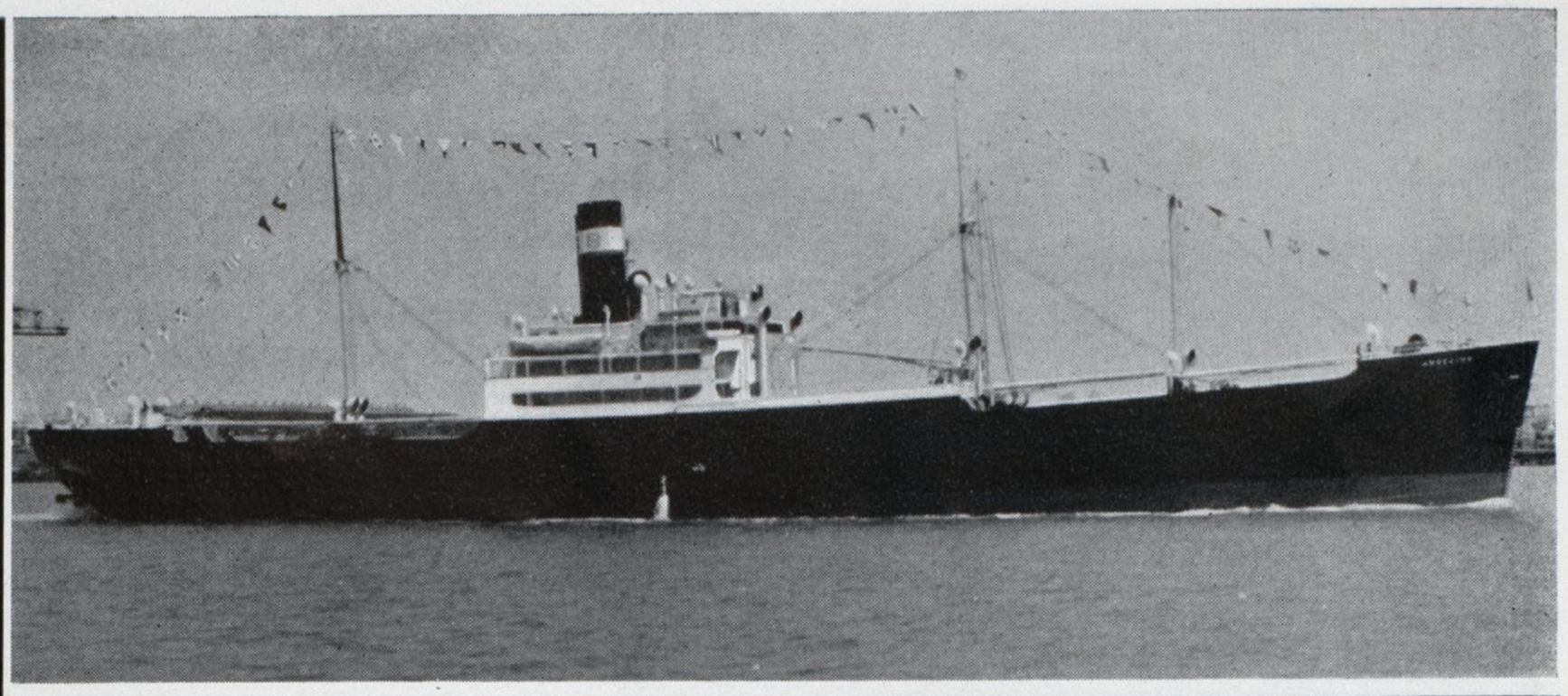

ANGELINA and Sister Ship have Westinghouse Air Compressors

SEVERAL years ago the A. H. Bull Steamship Company determined that with a source of compressed air aboard their ships they could remove rust and scale, paint the vessel, make emergency repairs, etc., much better than by the old manual method. Consequently all of their sea-going vessels were equipped with Westinghouse steam driven compressors.

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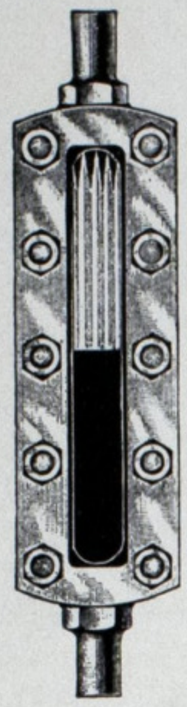

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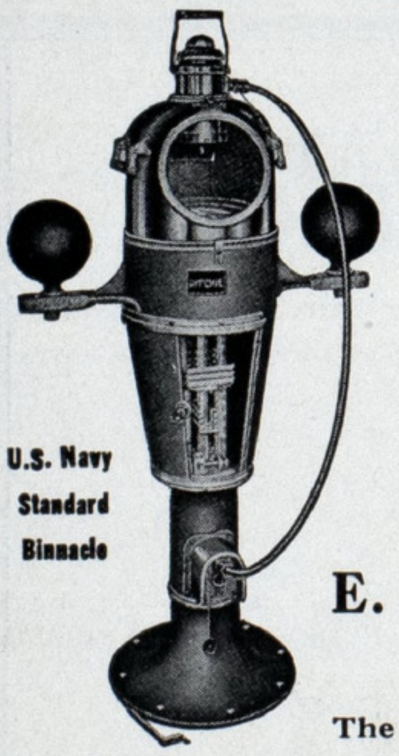

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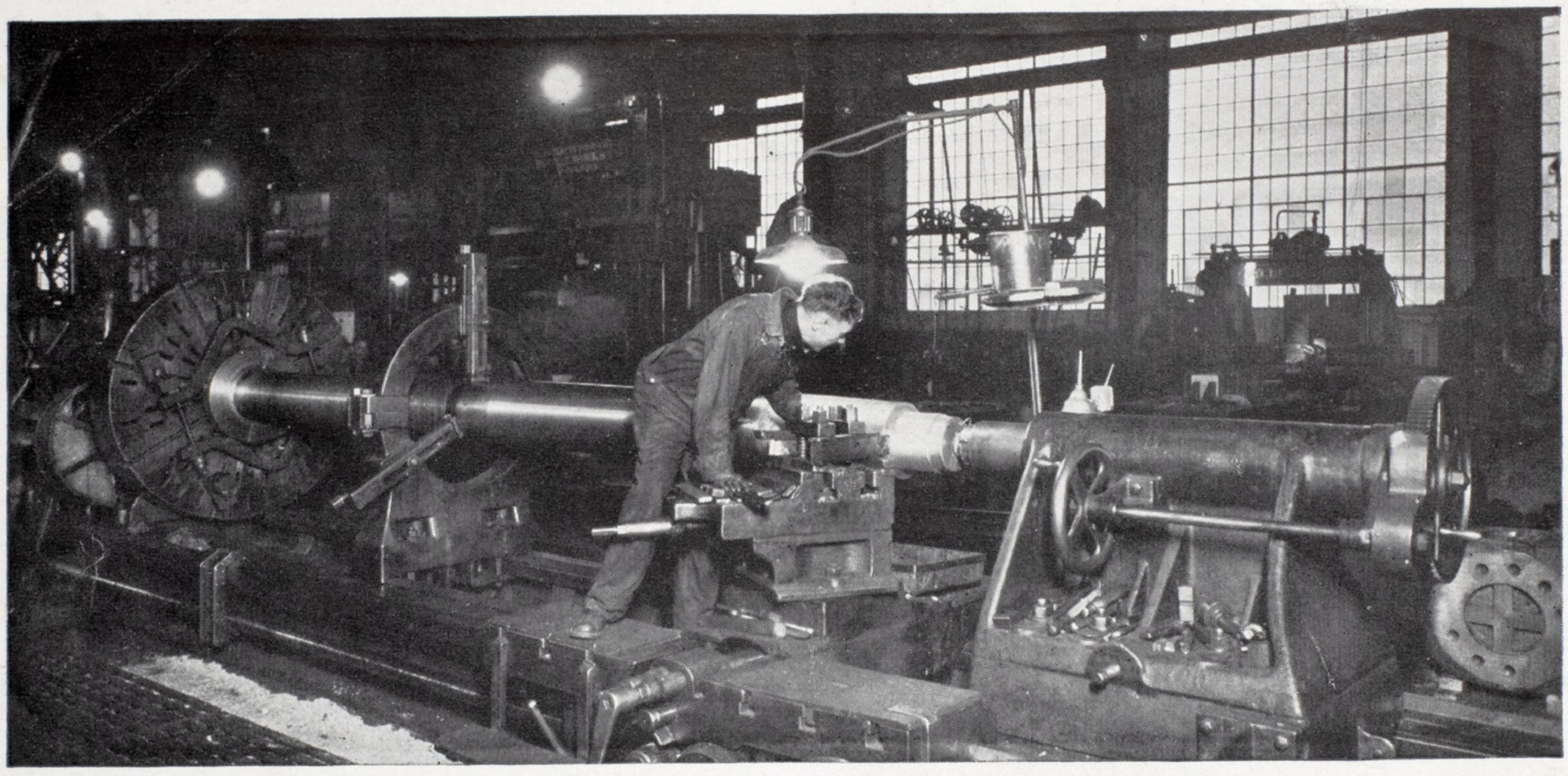

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